# People & the Planet

IPPF, UNFPA, IUCN

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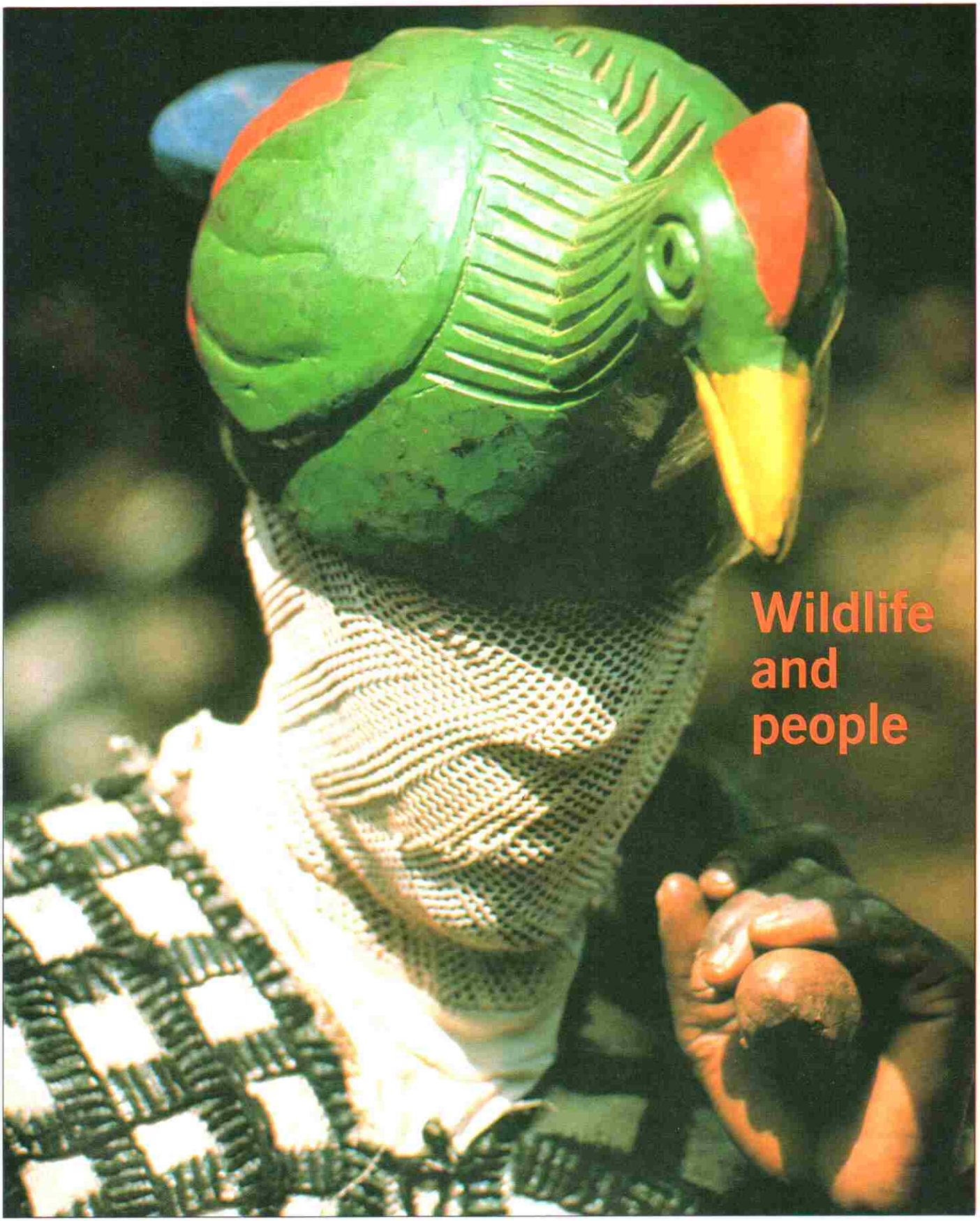

## Wildlife and people

# Partners for change

***People & the Planet*** **is a joint publication of the United Nations Population Fund, the World Conservation Union and the International Planned Parenthood Federation. It is published by Planet 21, an independent, non-profit, publishing company, in association with a wide range of international organizations which have an interest in various aspects of population, environment and development, and with funding support from the Swedish International Development Authority.**

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**Cover:** *Mask depicting the Bannerman's Turaco, a threatened species in Cameroon (see page 14).*

MARK EDWARDS/STILL PICTURES

■ *The next issue of* **People & the Planet** *reports on efforts around the world to create sustainable strategies for development.*

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Associate Editor: Jeremy Hamand
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Contributing Editors: Paul Harrison, Don Hinrichsen, Norman Myers

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Design: Zoë Davenport

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People & the Planet

# Beyond the butterfly

This issue of *People & the Planet* is about more than butterflies and birds. While these feature here, our aim has been to treat 'wildlife' as shorthand for the whole diversity of life on earth, including plant life, and to relate it to the diversity of human cultures. Both are under severe threat. Norman Myers and others have calculated that, already, the planet is probably losing between 50 and 150 species every day. Jeffrey McNeely, from the World Conservation Union (IUCN), writing in this issue, warns that half the world's 6,000 languages could well be lost within a generation or two. With them could go much of the unique information which they contain. As the world seeks new models of sustainable living, he argues, industrialized man might need traditional wisdom more than tribal man needs the modern world.

The origin of the threat to diversity of species and cultures is a complex and varied mix of man's voracious exploitation of resources and the desperate struggle of the poor to survive, allied to the relentless increase in human numbers. In a clear analysis of these connections Paul Harrison explains how every extra billion humans requires at least an extra 250 million hectares of land. This is an equation which could eat up over 80 per cent of the forest and wasteland in the developing world – or double all today's nature reserves – if population is allowed to reach the United Nations' high projection of 12.5 billion by 2050.

On the positive side, the work we report by BirdLife International to identify the hotspots of biodiversity – which complements other efforts to map critical areas of endemic plant life – gives some hope that local actions will be taken to protect more of these precious zones, nearly all of which lie outside the present network of parks and protected areas. The success stories we tell of local efforts to save local habitats gives some encouragement about what can be done. The example of juju dancers in the Kilum region of Cameroon, who pass on the message of sustainable living which will save not only the Turaco bird but the forests which provide a home for it, is a sobering reminder that local people can – and must be – a moving force in protecting their own environment.

It is mirrored by the efforts in Madagascar and Peru to work with local people to identify and make use of the medicinal and other resources of the forest in a way which benefits them. In the case of Peru it includes an effort to spread the knowledge of sustainable ways of living in the forest to the growing number of migrants who have no such tradition. Indeed the pressure of migration into species-rich forested areas is a recurring theme, as reflected in Stephen Mills' report from Nepal. There, around the Chitwan National Park, the government is encouraging community forestry and ploughing some of the tourist revenue back into local projects, in an effort to maintain a balance between people and park.

Just how such local actions can be encouraged and made part of strategies for sustainable development, everywhere, is a theme to which we shall return in the next issue of the magazine.

*John Rowley*

# NEWS FILE

## Consensus on population

The second Preparatory Committee meeting for the 1994 International Conference on Population and Development (ICPD), held in New York City on 10-21 May, ended on a positive note, *writes Jodi Jacobson*.

For perhaps the first time in two decades, the majority of government delegates and representatives of non-government organizations found common ground in their search for a set of forward-looking, integrated policies to stabilize global population and promote human wellbeing.

Major shifts in both substantive understanding of the issues and policies needed to address them were evident in the positions taken by a majority of governments. As a result, the body of delegates reached consensus on three critical points.

First is the explicit recognition that programmes aimed at reducing fertility must be conceptualized and made operational within a broader framework of goals and objectives, including efforts to improve reproductive health and secure reproductive rights, especially for women.

Second, is the central principle that efforts to slow population growth must be coupled with policies and programmes aimed at reducing consumption, alleviating environmental degradation, and promoting the development of people as a key resource for the future.

Third, is the growing understanding that it is no longer sufficient to speak of women's roles and status solely within the context of demographic trends. Instead, delegates realized the urgent need to make gender equity and the empowerment of women central objectives of the broader range of economic and social development initiatives.

## US turnabout

The most notable impact on delegates to the PrepCom meeting at United Nations Headquarters was the policy position of the United States, as articulated by former US Senator Tim Wirth, now Counsellor to the US Department of State and Head of its Global Policy Initiative.

In his speech, Wirth repudiated the policies of the past two US Administrations by recognizing the need for a fresh look at efforts to stabilize global population, and asserting that family planning programmes must be seen as one component of broader strategies to improve reproductive health care that include, among other things, increased access to safe abortion services.

Wirth's speech received a standing ovation – the first and only one in this forum.

## Road from Rio

Central to all the PrepCom discussions about the rapid change in the size and distribution of the world's population was the issue of consumption patterns, and, ultimately, the definition of 'development' itself.

Delegates representing both governments and NGOs were eager to make real over the next decade the integration of 'population and development' implied by the conference title. Delegates repeatedly referred to the policies and objectives outlined in Agenda 21, and to the need to ensure that the aims and outcomes of these two major world conferences were closely bound together.

NGOs were the most forceful participants in making these connections.

The NGO statement drafted during the Prepcomm pointed out that to date previously-made agreements to achieve 'Health for All by the Year 2000', reduce maternal mortality by half, attain universal literacy, were empty promises, and would remain so unless governments were willing to commit resources to these ends.

■ *Jodi Jacobson is a senior researcher at the Worldwatch Institute.*

## Setting goals

Speaking at the PrepCom, Dr Nafis Sadik, Executive Director of UNFPA, outlined the goals she would like to see incorporated in a new Plan of Action to be agreed at next year's Conference, of which she is the Secretary General.

She proposed that by 2015 all developing countries should reach, or be assisted to reach, the present average of the developed countries in such areas as infant mortality, life expectancy, education especially for women and girls, gender equality and availability and access to a full range of modern, safe and effective family planning services.

The world should aim at the low projection for population of 7.27 billion by 2015, as compared to the high projection of 7.92 billion or the medium projection of 7.6 billion.

By meeting the unmet need for family planning the world total fertility rate (measuring family size) could fall from 3.26 to 2.62 children by 2015.

A goal of spending 20 per cent of public expenditure on the social sector should be set, as an underpinning for "a truly integrated set of population, environment, consumption and development policies".

Overseas aid for population activities should increase from 1.5 to 4 per cent of the total.

## Women's voices

A Women's Declaration on Population Policies, prepared by a worldwide alliance of over 100 women's organizations, was handed to delegates at the PrepCom.

It sets out six main demands which, it says, unite women around the globe:

1. Put the wellbeing of women and men at the centre of population policies.
2. Balance efforts to stabilize population with equal efforts to reduce consumption by rich countries and rich people, because their consumption currently causes more global environmental damage than population growth in poor countries.
3. Guarantee all women access to quality reproductive health care, including wide contraceptive choices, pregnancy care, safe abortion, and prevention/treatment of sexually transmitted diseases.
4. Develop technology women can control that protects against sexually transmitted diseases as well as unwanted pregnancies.
5. Make reproductive health programmes and policies accountable to their primary clients – women.
6. Make men take responsibility for making babies, their sexual behaviour, and their partners' health and wellbeing.

■ *Text of the Declaration by Women's Voices '94 may be obtained from IWHC, 24 East 21st Street, New York, NY 10010. Tel:(212) 979 8500, Fax: (212) 979 9009.*

## Development Report

When William H.Draper III, outgoing Administrator of the UN Development Programme, introduced the first Human Development Report in 1990, he said that it opened the debate over the idea of putting people – rather than economies or projects – at the centre of development. The latest report takes the process further by examining just how far people really can participate in decisions which affect their lives.

It concludes that 90 per cent of the world's people have limited control over their lives, in spite of recent changes around the world favouring market economies, multi-party democracies and local activities.

To make the point that income alone is not a sufficient indicator of development, the Report ranks countries by a Human Development Index (HDI) which combines life expectancy, educational attainment and basic purchasing power. On this basis Japan ranks first on HDI, even though it is sixth in real gross domestic product. Barbados is first among developing countries with a ranking of 20, followed by Hong Kong, Cyprus and Uruguay. Guinea is bottom of the table, with Sierra Leone and Afghanistan.

The Report illustrates the depressed condition of some minorities by the case of the United States. There, if the African-American and Hispanic populations are treated as if they were separate countries, the white population would rank first, ahead of Japan, and these ethnic groups would fall into the 31st and 35th ranking.

To help build societies around people's genuine needs, with improved participation, the report calls for new concepts of 'human security' not just based on territory, for 'people-friendly' markets that combine market efficiency with social compassion, for more decentralization of power, more involvement by non-governmental organizations (NGOs) and more empowerment of the poor.

■ *The Report is published by Oxford University Press, New York and Oxford. $17.95/£12.95 (paperback).*

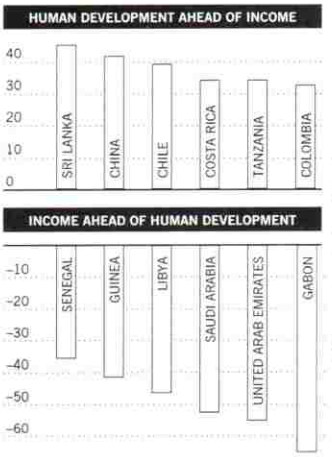
## Human development facts and figures

The 1993 Human Development Report produces some interesting facts for anyone interested in the progress being made in empowering people.

■ One quarter of the global population still survives in absolute poverty. The world's richest 20 per cent enjoy 150 times the earnings level of the poorest 20 per cent.

■ Rural populations, although making up two-thirds of those living in most developing countries, receive on average less than a quarter of the education, health, water and sanitation services.

■ Non-governmental organizations today benefit more than 250 million people, compared to 100 million in 1980. NGO grants from North to South are up from $1 billion in 1970 to $5 billion in 1990. Today they make up 13 per cent of official aid but only 2.5 per cent of total resource flows to developing countries.




There is no automatic link between income and human development

■ On average central governments in developing countries delegate less than 10 per cent of total national spending to local governments and less than 6 per cent of total social expenditure. This compares to averages of 40 per cent and 25 per cent in 15 industrialized countries studied.

■ All over the world, economies are growing but the number of jobs is not keeping pace. Less than one third of the increase in output in the developing world in the 1960-1987 period came from increased labour; more than two thirds came from capital investment. In the same period the labour force in developing countries increased by more than 400 million, "creating legions of unemployed". But in some countries, particularly in East Asia, land reform and investment in human resources have led to substantial job growth.

## Forestry research boost

A new research centre which aim to help policymakers understand the dynamics of deforestation and what might be done about it was founded earlier this year, *writes Winthrop Carty*. The Centre

for International Forestry Research (CIFOR) began work in February, with British forester Jeffrey Sayer as its first Director-General.

CIFOR falls under the aegis of CGIGAR (Consultative Group on International Agricultural Research), a loosely woven network of 17 international research centres.

CIFOR joins as the 18th research centre. It will be based at Bogor, a quiet Indonesian forest research centre not far from Jakarta.

As things stand, Sayer points out, forest research concentrates on how to "improve yields, not solve social problems". Further, donors tend to support research on a bilateral basis. What is missing is the development of new strategies that can upgrade the quality of forestry research in developing countries.

CIFOR certainly won't be an advocate of maintaining pristine forests. "We must intensify forest use," says Sayer. "We will research ways people can use the forests in a sustainable manner."

## Zambia setbacks

While two-thirds of Zambia's one-year-olds are fully vaccinated, there has been a steady increase in childhood deaths, according to the latest Demographic and Health Survey.

The rate of childhood mortality has risen by 15 per cent in the past 15 years, and one in five of Zambian children die before reaching the age of five. Malnutrition associated with early childbearing, short birth intervals and a decline in exclusive breast-feeding for young babies are part of the problem, with 40 per cent of young children short for their age.

Economic problems, lack of medical care, malaria and AIDS compound the situation.

Women are having six to seven children, a slight decline on the estimated fertility rate of 7.2 children in 1980. But only 9 per cent are using family planning, even though a third of all married women who are not using a method would like to stop having children or wait for at least two years for another child.

Women with secondary education have, on average, two fewer children than those with no formal education.

■ *Contact: Macro International Inc., DHS Division, 8850 Stanford Boulevard, Suite 4000, Columbia MD 21045, USA.*

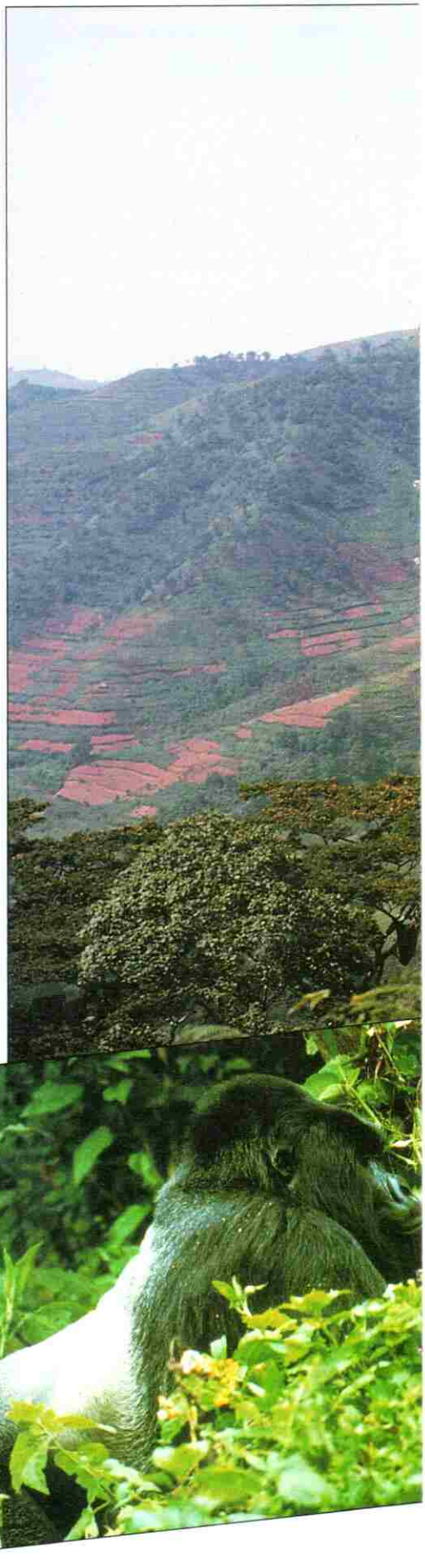
## Quote

"If we are not helping to reduce poverty, we're not doing our job." (World Bank President Lewis Preston, in the foreword to a new report: *Implementing the World Bank's Strategy to reduce Poverty*.)

# Wildlife and people:

## scrambling for space

**The threats to the planet's vast array of plants and animals all derive from the overwhelming dominance of the human species, writes *Paul Harrison* in this careful analysis of the present and threatened impact of human populations on the world's wildlife.**



T. BUTYNSKI/WWF

We have no idea, to within the nearest 10 million, how many species there are on earth. Around 1.5 million species have been classified, but everyone agrees that this is only a small percentage. Estimates of the total number of species range between 5 million up to 90 million or more.

Most species are not cuddly or beautiful: we live on a planet numerically dominated by insects and their food. All the vertebrates lumped together add up to only 42,500 species, yet there are 750,000 known insect species and a quarter of a million plants. Many of these may be crucial for the maintenance of an ecosystem, but often we won't know which until it's too late. We have no choice but to aim for maximum species survival, and conservation of as many habitats as possible.

The threats to species diversity are many, but they all derive from the overwhelming dominance of the human species. We are the fiercest of all competitors and predators, but we also exert a vast unintended pressure through pollution, introduction of alien species, and our sheer demand for space.

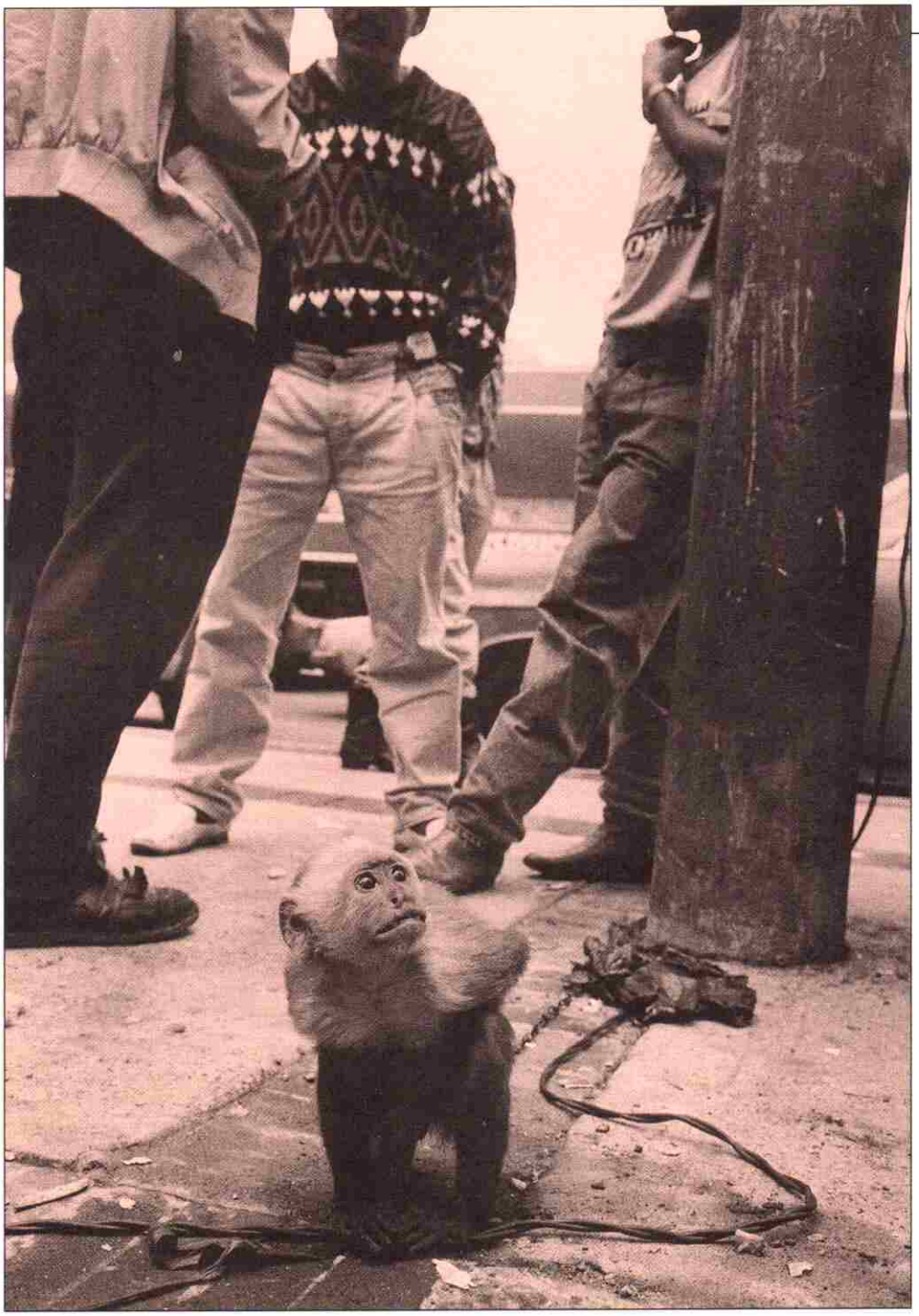
To say that the greatest threat is from the size and growth of our population would be simplistic. Human numbers never act alone, but always combine with consumption levels and the technologies we use to meet our needs and dispose of our wastes. The threat comes from our *total* impact.

Threatened species usually come under fire from several directions at once, but there have been some attempts to sort out threats by order of

M. TERRETTAZ/WWF

**Above:** *Pressure on the Bwindi Forest, Uganda, showing cultivation on steep slopes right up to the border.*
**Far left:** *The Mountain Gorilla, threatened by human pressure in Rwanda.*
**Left:** *Rainforest cleared for ranching, Brazialian Amazonia.*

MAURI RAUTKARI/WWF



**Left:** *A Dusky Titi Monkey on sale in a Bogotá street, in violation of local laws.*

TIMOTHY ROSS/J.B. PICTURES

importance. Habitat loss is the greatest danger. By one estimate, it affects between 53 per cent (for reptiles) and 78 per cent (fish) of threatened vertebrate species. Over-exploitation through hunting and capture comes second. It impacts on 12 per cent of threatened fish species and 63 per cent of reptiles. The third major cause, affecting 6 to 28 per cent of threatened species, is the impact of introducing alien species.

Another survey in Australasia and the Americas found that habitat loss affected 76 per cent of mammals. Within this category expansion of settlements threatened 56 per cent of species, expansion of ranches 33 per cent, and logging and plantations 26 per cent. Exploitation affected 50 per cent of endangered species, with the use of meat, fur and hides dominant. Alien introductions affected 18 per cent.

In last year's Global Biodiversity Strategy, population growth was cited as number one out of six fundamental causes of biodiversity loss. It is a factor in direct exploitation – especially where growing subsistence communities use meat from wild species for their own consumption. Even where they sell captured wild animals to traders for cash, population growth is a factor.

Even introduction of alien species has population links. The biggest wave of introductions went along with European colonialists: but population growth in Europe was a strong 'push' factor leading to emigration.

The clearest and strongest links, however, are with habitat loss. Here there is a strong statistical association with population factors. Recent estimates have found that population *density* explains between 64 per cent and 92 per cent of the variation in rates of deforestation.

IUCN data from 50 countries show a very clear population effect. The top 10 countries for wildlife habitat loss had average population densities of 189 people per $km^2$ – the 10 that retained most original habitat had densities of only 29 people per $km^2$.

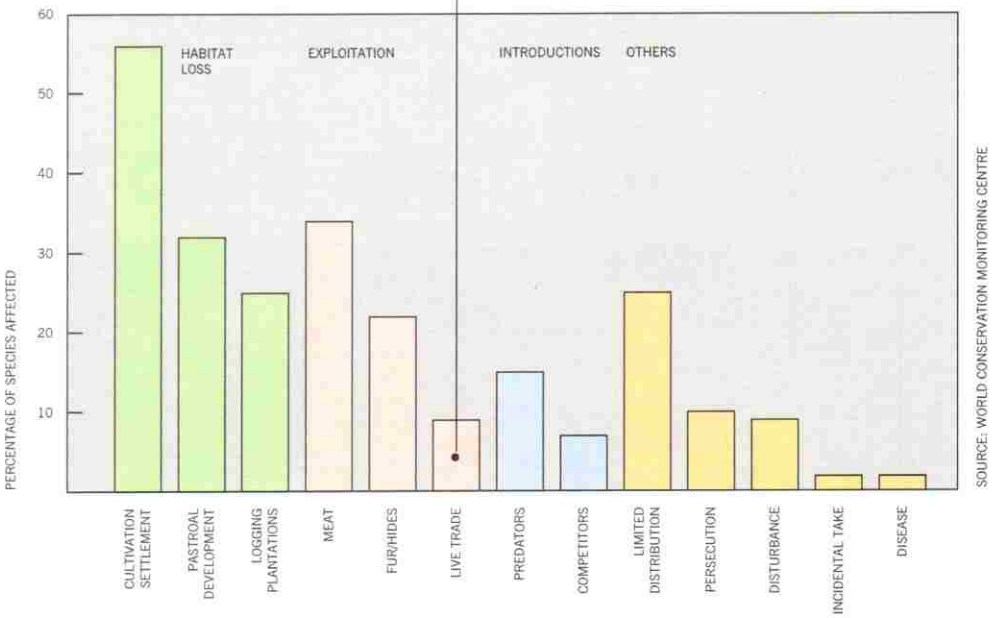
The link on the ground is often very clear. The mountain gorilla in Rwanda was directly threatened by encroachment on its territory by surrounding farmers. In 1926, when the volcano area was declared a national park, the population of the surrounding Ruhengeri district was around 200,000. Six decades later it had trebled to 619,000, and there were 418 people per $km^2$ – not far short of the Netherlands, highest in Europe – and rising fast.

As the population grew so did encroachments and 'poaching', and political pressure to hand over parts of the park for farming. Between 1958 and 1979, the park shrank from 328 $km^2$ to only 150 $km^2$. Over this same period gorilla numbers fell from an estimated 400-500 to under 270. Protection by the mountain gorilla project raised the numbers to 290 by 1986 – but the population pressures are still there, complicated at present by war.

Logging is a major cause of loss of habitat – not because it causes deforestation, but because it alters the forest ecosystem, reduces species diversity, and may cause local extinction of certain species such as fish, or animals dependent on the tallest trees of the canopy.

But it is misleading to suggest that logging is mainly due to the 'hardwood window' connection – luxury demand in the north. Forest products are a basic consumption need in furniture and housing. Demand increases as populations and income levels grow. The great bulk of Third World timber production now goes to meet the timber needs of the Third World. In 1988

**Threats to mammals (Australia and Americas)**




home use of sawnwood in developing countries exceeded exports by eight to one, and in the case of industrial roundwood by almost 11 to one. *Net* exports of industrial roundwood from developing countries amounted to 11 per cent of production in 1977, but only 1 per cent 11 years later.

Strictly speaking, only conversion of forest to other uses like farming, ranching or housing causes deforestation. Some idea of the relative shares can be had by looking at land use changes. Between 1973 and 1988 developing countries lost 1,450,000 km² of forest. Most of this went directly or indirectly to meet the demands of population growth. Around 400,000 km² was accounted for by growth in farmland. An even bigger share, 856,000 km², was claimed by houses, roads, factories and so on. Excluding ranching in Latin America, and allowing for growth in food consumption per person, I have calculated that meeting the needs of population growth accounts for probably 79 per cent of forest loss.

Rainforest ranching, like logging, is often blamed on Northern meat demands. This 'hamburger connection' may apply in Central America. Elsewhere it is a myth. In 1989, for example, Latin America had a herd of 313.7 million cattle, yet her net exports were only 0.8 million head live plus 100,170 tonnes of meat. As with timber, it is home demand for livestock products – driven by the twin engines of population growth and rising incomes – that leads to growing livestock numbers and pasture areas.

The population factor is also important in loss of other wild habitats such as mountains, grasslands and wetlands. In most parts of the developing countries expansion of farm and urban land is the main driving force behind the loss.

In developed countries the main engines are rising incomes and changing tastes in leisure, tourism, shopping and so on. But population growth is also a factor, especially in countries of large-scale immigration such as the USA, Canada and Australia.

Future population growth is a serious threat to habitats. Every extra person needs space, for housing, transport, jobs. The needs vary widely, but an FAO survey found average requirements for non-farm land to be about 0.056 hectares per person. On top of this are land requirements for food production. These vary with land quality and technology. But let us make the optimistic assumption that each extra person will need 0.2 hectares – the current level for irrigated, high-yield East Asia.

Very conservatively, the total land needs of each extra person are at least 0.25 hectares. For every extra billion people, therefore, an extra 250 million hectares (or 2.5 million km²) will be needed, and they will be taken from what is currently wildlife habitat. If we achieve the UN low population projection of 7.8 billion by the year 2050, our needs will be an extra 5.75 million km² – equivalent to over 90 per cent of all forest and woodland in Africa. If we hit the high projection of 12.5 billion, then we would need an extra 17.5 million km² – equivalent to over 80 per cent of all forest and woodland in developing countries today. The difference is equivalent to double all the world's nature reserves.

The greatest potential threat comes from climate change. Plant and animal species have particular requirements for temperature and humidity. Global warming will shift the patterns of these on the map, moving colder areas uphill and towards the poles. Some cold habitats will shrink absolutely. In other cases species may be unable to migrate fast enough, or their path may be blocked by zones of human use.

Mountain ranges and smaller national parks could in some cases become killing fields, with species trapped in zones that have become unsuitable for their needs. A recent study of the Great Basin, in the United States, found that 23 per cent of mountain butterfly species and 44 per cent of mammal species could become locally extinct with a regional warming of 3°C.

Population growth plays its role in global warming, too. It has little to do with the increase in chlorofluorocarbons. But between 1960 and 1988, I have estimated that it was responsible for just over 40 per cent of the increase in carbon dioxide emissions. In the case of methane emissions from livestock and rice paddies, the population share was around 70 per cent.

Clearly species losses will be high whatever we do: the task is to minimize the losses. We will have to adopt a many-faceted strategy ranging from direct efforts at habitat and species conservation, to broad changes in technology, consumption patterns, and values.

Actions to slow population growth must be part of the strategy. Their environmental impact can be very considerable – in many cases bigger than for any other factor. And since they include not just family planning but advances in women's rights, education levels, and mother and child health, they probably have more beneficial effects than most other components. ■

*Paul Harrison is a* People & the Planet *contributing editor, and author of* The Third Revolution *(Penguin, £6.99 or $12). He won a 1992 Population Institute Global Media Award for population and environment reporting.*

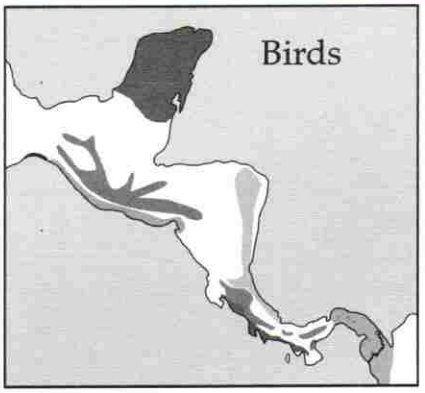
*World map shows Endemic Bird Areas (EBAs). Some are more important than others in terms of their biological value and the threats they face.*

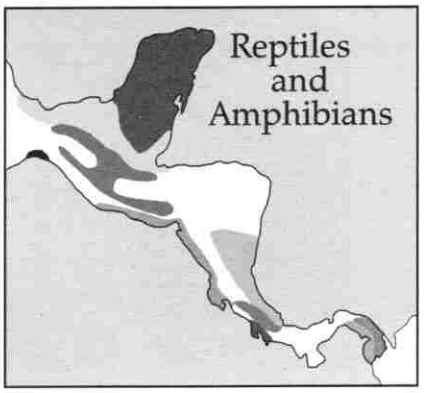
*Central American maps show areas of endemism with their own unique complement of species found nowhere else in the world.*

# How birds help map hotspots

**In a pioneering study, BirdLife International has discovered that birds can help pinpoint hotspots of biodiversity.** *Yvonne St Hill* **reports.**

BIRDLIFE INTERNATIONAL




The rapid loss of biodiversity emerged at the Earth Summit in Rio as one of the most urgent priorities for action. Representing the total variety of life on earth and all its genetic inheritance, biodiversity includes not only species, but whole ecosystems and ecological processes. It has to be conserved, and an essential first step is to make a map of the critical regions and zones.

Unfortunately, for most forms of life the data is just not available. It will take years to collect. However, birds have already been extensively studied and make excellent indicators of overall biological diversity. This is because they are among the major groups to have dispersed to, and diversified in, all regions of the world.

Moreover, the classification of birds, and their distribution are well enough documented to make global analysis relatively easy. By studying species of birds with a limited distribution which appear nowhere else on earth, these areas of endemism can be pinpointed as priorities for wider conservation action.

Birdlife International set out, in 1988, to do just that. The project mapped the global distribution of restricted-range landbird species with a breeding range of less than 50,000 km$^2$ – or some 27 per cent of bird species. Three key findings emerged from this study.

First, there are concentrations of restricted-range birds, often on islands or in isolated patches of a particular habitat. In fact, over a fifth of the world's bird species are confined to only 2 per cent of the land area. Areas where two or more bird species are entirely confined can be considered to be hotspots of first importance. And these have been dubbed Endemic Bird Areas or EBAs.

The study charted 221 EBAs, spread over 148 geo-political units. Of these, 76 per cent were in the tropics. Indonesia was shown to be by far the most important country, containing 24 Endemic Bird Areas. Mexico, Colombia, Ecuador, Brazil, Peru, the Philippines and Papua New Guinea all have more than nine.

The second finding of great significance is that clusters of unique species from other life-form groups are also found in these same areas. In other words there is considerable overlap between bird conservation hotspots and those for other species. The conclusion is that by targeting limited resources directly on conserving the EBAs, a very high proportion of the world's overall biodiversity can be saved.

Finally, an analysis of how the boundaries of the 221 EBAs compared with existing protected areas showed that 92 per cent of the land in these vitally important areas is, at present, unprotected.

An overview of these findings, providing a new framework for biodiversity conservation, was first published in July 1992 under the title *Putting Diversity on the Map: Priority Areas for Global Conservation.**

BirdLife International is now aiming to spread the word, to both governments and non-governmental organizations, about the existence of these important areas of biodiversity and to encourage action to save them.

It believes that the opportunities for environmental management which have been created by identifying these hotspots have tremendous implications not only for nature conservation, but for the socio-cultural and economic wellbeing of people. In an economic sense biodiversity represents imaginable wealth; in its ethical sense it is priceless. ■

■ *Norman Myers adds:* This 'birds hotspots' strategy is a splendid expansion of the original hotspots analysis which I based on endemic plants.

It turns out that a full 20 per cent of plant species are confined to a mere 0.5 per cent of Earth's land surface. Moreover, and in contrast with the birds-based analysis, the plant hotspots are characterized by a second criterion: they all face imminent destruction of habitat.

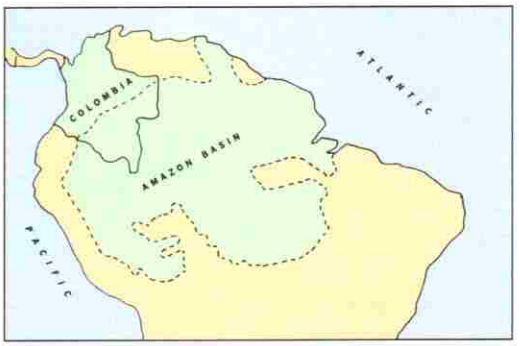
Nevertheless, there is much overlap between plants and birds. Of the eight bird countries cited, six are plant countries too.

*International Council for Bird Preservation, Cambridge, UK. £12.50/$23.50.

ATLAS OF THE ENVIRONMENT

# Diverse nature, diverse cultures

**Humanity can only exist, in the long term, through an interweaving of nature and culture. But today both biological diversity and the diversity of cultures are being depleted, warns *Jeffrey McNeely*. He believes that tribal wisdom may point the way to new adaptations by the modern world.**




*The Tukano people have an intimate knowledge of the plants and animals of the north-west Amazon.*

The forests of the north-west Amazon of Colombia harbour a profusion of species of plants and animals, often considered part of the world's greatest remaining tropical wilderness. But for the Tukano people who live there, it is not a wilderness – it is home, and they have developed a detailed knowledge about how to wrest a living from this seemingly-inhospitable environment.

For the Tukano perceive their 'wilderness' environment as man-made, transformed and structured in the past by the symbolic meaning their ancestors gave to resources and the knowledge they developed about how to use plants and animals to enable people to survive. To them, the forest is a system of resources in which the energy produced is directly proportional to the amount of energy it receives. They know that they cannot harvest more than the forest can produce, but they call on detailed knowledge about which species can be used for what purposes – in some parts of the Amazon, more than 90 per cent of tree species are used by people.

Their long tradition of constant observation of animal behaviour, acquired as part of their daily struggle to survive, provides guidance on what adaptations are possible. Their myths tell of animal species which were punished by the spirits for indulging in gluttony, boastfulness, improvidence, and aggressiveness, serving as examples to human society. Animals become metaphors for survival, and by analysing their behaviour, the Tukano find an order in the physical world within which human activities can be adjusted.

The Tukano relationship with wild-

BRIAN MOSER/HUTCHISON LIBRARY

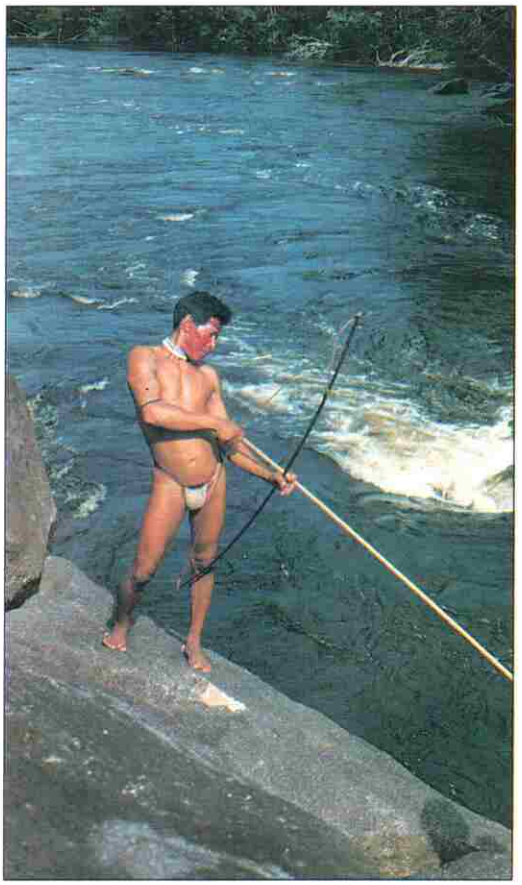
life is typical of people whose welfare depends on how they manage resources. Like many such traditional people, they limit their own harvests, guided by a thorough knowledge of population levels and ecological relationships and restrained by their traditional code of ethics. Such people walk lightly on the landscape, with such success that outsiders often consider their habitats a 'wilderness', as if no people had ever lived there.

Throughout history, local societies have ebbed and flowed as their wisdom was tested against the criterion of sustainability. Those societies that were able to develop the wisdom, technology and knowledge to live within the limits of their environments were able to survive. Others which have over-exploited their resources flourished only briefly, giving up sustainability and adaptability for a flash-in-the-pan flush of immediate wealth.

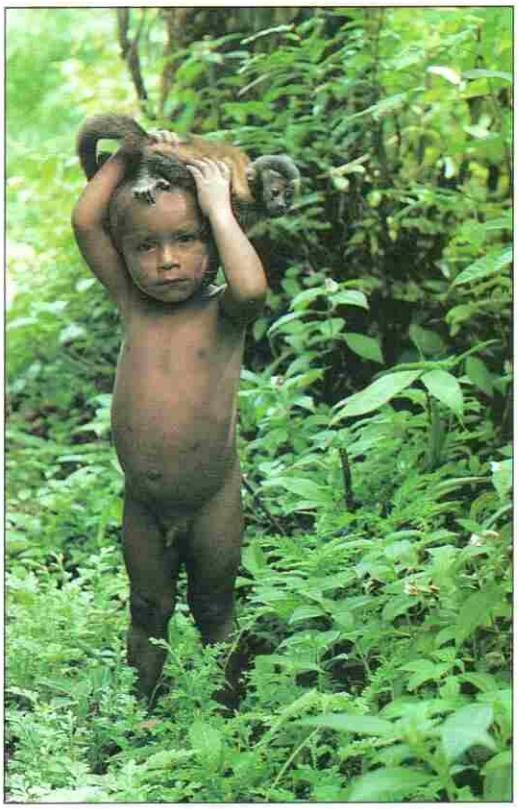
Over the past several generations, the highly diverse and often localized adaptations to local environmental conditions – as illustrated by the Tukano – have been replaced in most places by a world culture increasingly characterized by very high levels of material consumption, at least for a privileged minority. Economic growth based on the use of fossil fuels as an energy source, greatly expanded international trade, and improved health measures have spurred such a rapid expansion of human numbers and consumption that new approaches to resource exploitation have been required.

These approaches, often involving powerful machines, arcane economic instruments and sophisticated technology have overwhelmed the conservation measures that local communities had developed from long experience. Cultural controls on over-exploitation, such as self-imposed restrictions on hunting certain animals or females during calving seasons, ownership of grazing rights and forest resources, rotation of hunting zones, taboos on hunting certain species, limitations on forest clearance, and protection of special groves of trees for religious reasons, have not been able to stand up to the seductions of the global market system, especially when harvesting rights are given to outsiders.

For traditional peoples are not instinctive paragons of ecological virtue. Indeed, many traditional societies have been characterized by high levels of aggression towards their neighbours and numerous examples can be quoted of species of animals hunted to extinction by technologically simple cultures. When the United States Congress established 'native corporations' to bring Alaskan natives into the economic mainstream in the 1980s, some forests in the rich south-east were stripped bare of their timber, leaving devastation behind. But when local people are part of a local ecosystem, their behaviour directly affects their own survival. Cultural mechanisms that have been developed as adaptations to the environment over tens or hundreds of generations are quickly cast aside when trade frees people from the traditional constraints imposed by their local ecosystems, changing them from what the distinguished ecologist Ray Dasmann calls 'ecosystem people' into 'biosphere people' who can draw from the resources of the entire world.



**Left:** *Tukano house, its front decorated with clay, charcoal and chalk.*
**Below left:** *Tukano fishing in an Amazon tributary.*
**Below:** *Tukano child with pet monkey, and pet bird at house entrance.*



BRIAN MOSER/HUTCHISON LIBRARY

As rapidly-growing populations and expanding development activities tie the world together into a seemingly inextricable knot of over-exploitation and over-consumption of natural resources, it is not surprising that we are also losing the diversity of human cultures. Estimates are that over half of the world's 6,000 languages are now spoken only by middle-aged or elderly people, dooming those languages – and the unique information they contain – to extinction within the next generation or two.

Today, both biological diversity and cultural diversity are being depleted, posing a very real threat to humanity, which can exist in the long term only through the interweaving of nature and culture. Unfortunately, nature and culture have long been seen as distinctly different subjects, but perhaps this separation is at the very heart of environmental problems. An appreciation of traditional knowledge could perhaps help bring these two elements back together. The issue is not simply the density of human population or the impact of people on the environment but rather the whole range of technology, knowledge and experience that accompanies a given society's production system. Throughout the world, resources historically have been managed by diverse human societies via cultural mechanisms that give social and symbolic value to land and resources beyond their immediate extractive value. These symbolic relationships often represent a set of ecological principles that constitute a system of social and economic rules that have a highly adaptive value in the struggle to maintain a viable equilibrium between natural resources and the demands of society. The symbolic values helped enable the society to avoid over-exploitation and to live within the limits imposed by the availability of resources. Today's dominant symbol is money, and it is replacing natural symbols of proven worth to people.

Given the human proclivity to deplete natural resources, societies need to develop highly adaptive behavioural rules for survival, supported by coherent belief systems built on a foundation of strongly motivating values which enable people to endure the challenges of existence in an unpredictable world. What will be the inspiration for the rules that will guide our society into an uncertain future?

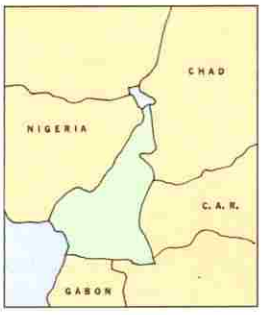
In his 1992 book, *Millennium: Tribal Wisdom and the Modern World*, the anthropologist David Maybury-Lewis pointed out that as the end of the century draws near, the modern world is marked by unprecedented degrees of confusion, insecurity and yearning for change. Industrial society no longer has self-confidence in the face of the future, and indeed the future itself has been brought into question. These are the conditions in which the value of tribal wisdom can be fully appreciated. After decades when consumption and growth have come to dominate modern lives, the new century brings an opportunity to consider new models for living in balance with our resources. The modern world may need traditional wisdom more than tribal peoples need the modern world. ■

*Jeffrey A McNeely is Chief Biodiversity Officer at the World Conservation Union (IUCN).*

# Saving the bird – saving the forest

ALL PICTURES: MARK EDWARDS/STILL PICTURES

**Award-winning photographer, *Mark Edwards*, travelled to the Kilum Forest in Cameroon to photograph a project which is trying to save one of Africa's most beautiful birds – the Bannerman's Turaco. He came back with these pictures, and a remarkable success story.**




The mural on the school house is the visitor's first impression of the Kilum Mountain Forest Project. It is a startling blend of Picasso, Miró and Matisse. A huge bird, as large as the children who painted him, sits confidently on a slender branch surrounded by forest animals. The bird, a Bannerman's

**Left:** *Schoolchildren paint an environmental mural, dominated by the Turaco.*
**Below:** *Planting contour hedging to prevent erosion.*
**Right:** *Traditional healer collecting medicinal plants.*
**Below right:** *Women's nursery provides tree seedlings.*

Turaco, is a threatened species and is the reason for the project.

Working on the principle that to save the bird you have to save the forest, BirdLife International embarked on an ambitious scheme which involves chiefs, medicine men, women's co-operatives, juju dancers, farmers, schoolteachers and children.

In 1987 a representative for BirdLife visited Mount Kilum and estimated that all the forest would disappear within 10 years. Local people, concerned about the effects of deforestation, talked about a time when rivers were twice as full. During the dry season, which lasts five months, farmers rely on water stored in the forest above the village, so it was clear to everyone that deforestation was responsible for the water shortage.

This was the starting point for a dialogue between the many groups of local people, each with their own interests to protect, which has lead, against all the odds, to the development of a remarkable project.

The forest is, of course, as vital for the survival of the Bannerman's Turaco as it is for the people who live within its watershed. In the mountainous region, topsoil exposed when the forest is cleared is soon dispatched by torrential rain – up to seven inches of water may fall in an hour. A solution had to be found to break this familiar circle of destruction.

Dervla Murphy describes her visit to Cameroon in *Cameroon with Egbert*. "Reading about erosion tragedies, the mind is numbed by an anaesthetic of hectares and years and millimetres and tons and centuries. It is another matter to see and smell and struggle through the event as it is happening. Miserably we squelched and skidded across those tons of squandered soil – made still more poignant by the frail maize seedlings, killed in infancy, that occasionally showed through. That storm had brought disaster to a family as well as a mountain, a family who had worked themselves to exhaustion to clear the land. They had not meant to commit an ecological crime; they only wanted to feed and clothe and educate their children. In Cameroon one cannot feel the rage provoked by the activities of American beef ranchers in Amazonia or Japanese logging companies in Borneo. One can only feel despair.

"These two scenes – the newly burnt miles around Lake Ocu and the denuded mountain – could be used in a strip cartoon for children to illustrate the fragility of our planet: and especially of 'Africa', where geological old age is a problem. The soil is geriatric, African rocks and mountains being some 4,000 million years old. They therefore weather into coarse, large-grained soils, as is apparent even to non-scientific travellers. These are easily eroded, poor at retaining nutrients and water, low in phosphorus and nitrogen and so by far the least fertile in the world. That visually attractive red soil so common in Africa is in fact a menace. Being full of iron oxides it tends to crystallize, forming rock hard uncultivable wasteland. Stripped of vegetation, Africa will die – both the land and the people."

A series of measures were proposed by BirdLife representatives. A boundary was agreed around the remaining forest and a halt called to further clearing above that line. Each village elected two people to patrol the forest and mobilize villagers in case of fire and check that the forest boundaries are observed.

In order to reduce the need to clear more forest for agriculture, extension workers trained by BirdLife help farmers build contour hedges, mostly of native nitrogen-fixing trees, which help hold the soil. Tree nurseries run by women's co-operatives provide the seedlings.

Another problem was solved, again by patient, persistent negotiation. Goats, kept by a few families, were preventing forest regrowth. Gradually the herders were persuaded to keep their animals in fenced paddocks made from thorny shrubs grown in tree nurseries.

The real success of the Mount Kilum Project is the way everybody in the villages has been involved. The honey gatherers have been helped to form a

co-operative to market honey to the supermarkets. The traditional healers who gather their medicines from the forest play a part, the children are taught conservation skills at school, and the juju dancers dressed as forest animals and birds have adapted their story to teach the message of sustainable living.

Ultimately its success must depend on reducing population growth, at present estimated to be 3 per cent. This may be possible. The dialogue which has been opened has forced people to reconsider traditional assumptions and experiment with new ways of farming and working together. It may well be possible to extend this debate to include family size. If that does occur the Bannerman's Turaco will survive along with the farming communities in this beautiful part of Africa. ■

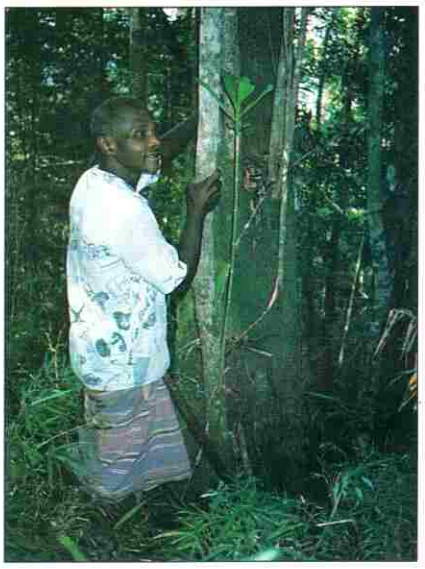
# Saving Madagascar's treasury of plants

**When Madagascar split from the supercontinent, Gondwanaland, about 160 million years ago, it took with it the genesis for a wealth of plant life. Today, there are an estimated 12,000 species of flowering plants on the Indian Ocean island, about 80 per cent of which are found nowhere else.** *Hilary de Boerr* **reports on a new initiative to save this inheritance from the twin threats of commercial development and population growth.**

This botanists' treasure trove is home to more than 1,000 species of orchid. One of the more fascinating ones (*Angraecum sesguipedale*) glows in the dark to attract the nocturnal hawkmoth that pollinates it. The moth needs a 45 centimetre tongue to reach the nectar. Decades ago, when Charles Darwin predicted that a moth with such a long tongue must exist because of the plant's 45 centimetre spur, scientists of the day said his hypothesis was rubbish. But observations have substantiated his prediction.

In addition to the beautiful orchids, there are aloes, palms, baobabs, epiphytic ferns, bamboo, moss and lichen in a wide range of habitats. Of the 400 flowering plan families worldwide, almost half are found here.

Madagascar – the world's fourth largest island after Greenland, New Guinea and Borneo – shot to botanical fame with the discovery that its rosy periwinkle (*Catharanthus roseus*) contained compounds for treating leukaemia. The island's 18 tribes have long been aware of the medicinal properties of their plants. They have been treating themselves herbally for centuries, for ailments ranging from fever to eczema to tumours. Even the orchids are used for medicinal purposes. For example, another species of orchid, *Angraecum eburneum*, is used as antiviral drug and to prevent miscarriages.



ALL PICTURES: NATHANIEL QUANSAH/WWF

The people who know the island's vegetation are sharing their information on the plants that they use for particular purposes, as part of a World Wide Fund for Nature ethnobotanical project in the country's north-west.

Ethnobotany is the study of plant use by peoples of different cultures, and is a growing discipline worldwide. But the race is on – untold numbers of

ROYAL BOTANIC GARDENS, KEW/WWF

**Left:** *Orchid used as an antiviral drug and to prevent miscarriage.*
**Right:** *Forest fruit used locally for abortions which could have wider use in family planning.*
**Far right:** *Rosy Periwinkle, used for anti-leukaemia drugs.*
**Below:** *Medicinal plant stalls, Antananarivo.*
**Bottom:** *Medicinal plant specialist identifying forest plant.*

undiscovered species are lost every day through commercial practices like logging, agriculture and mining. In Madagascar, a fast growing population of 12 million people means high demand for land. Four-fifths of the island's natural forest has been destroyed, and current rates of deforestation could leave forest cover on only the steepest slopes by about the year 2020.

University scientists and doctors work with project leader Dr Nathaniel Quansah to determine the links between local communities, local plant diversity and their uses. In return for assistance from the Malagasy villagers, project members attempt to address local concerns and discuss the value of conserving species for long-term use.

Dr Alan Hamilton, project supervisor, says there are two overriding ethics to the work. "First, there's the idea that if you take something out, you put something back. And the key is the local community and its culture. You have to respect them."

Health is the main concern of villagers living in and around the project site at Manongarivo Special Reserve, a 35,000 hectare forest of high biological diversity. The nearest clinic is 80 km away, and a third of the journey often has to be made on foot. Drugs are very expensive. Transport is also a problem because of poor road links, and there is growing concern about the environmental impact of the traditional slash-and-burn method used for clearing land for rice growing.

The project's contribution to the community therefore focuses on such issues. The feeling is that local people might agree to conserve the forest if a clear link is established between it and their health. Establishing a primary health care system could underline the value of local medical preparations and provide modern medicine where necessary.

Ten post-graduate students and 26 final year students from the University of Antananarivo are split into teams, which work closely together and with the local community. The health care field team comprises a traditional plant specialist – a man called Ndronalahy; ethnobotanists, who survey medicinal plant knowledge and use; and doctors, who identify diseases and record the effectiveness of local medicines. The laboratory team, made up largely of pharmacologists, runs lab tests on plant extracts and provides results for discussion with the local community. Chemists extract and identify chemicals.

The four-year-old project has proved its worth to villagers. In March, this year, it opened an integrated health care clinic and research centre – which Hamilton calls "a milestone in the search to find ways of achieving sustainable development in harmony with local cultural values and conservation of natural resources". Local people were involved in the building design, using local materials where possible.

The plan is for six doctors to work two-month stints, examining patients and identifying diseases. A traditional plant specialist attends some sessions, giving his own diagnoses and treatment. Local medicines are always used if available, while modern remedies are available free or at cost. "This is certainly the first clinic of its kind in Madagascar. There are very few, if any others in Africa," says Hamilton.

The project has already had its ethnobotanical successes. Four of the students have completed higher degrees, including a chemistry PhD on the plant, *Ficus polyphlebia* – which is used locally for abortions and which could have a wider application in family planning.

WWF is keen, however, that the local community continues to benefit from the use of its endemic species. If the pharmaceutical companies become involved, then WWF plans to help the local people develop the means to benefit from fair financial returns. Care must be taken to ensure that collection is sustainable, nurseries are established and that the trade in succulents is carefully controlled.

Dr Quansah hopes to extend the project around the country, with travelling field teams reporting back to a central lab. That would provide data on the distribution of diseases in Madagascar, the varying uses of plants to treat them, and the effectiveness of treatments. Certain medicines could be pinpointed for local manufacture. And careful targeting of modern medicines could help reduce the enormous cost of imported medicine to such a poor country like Madagascar – which uses up $60 million of the country's precious foreign exchange every year. ■

*This is one of the first in a series of* People for nature, nature for people *feature articles prepared for WWF.* *(see page 29).*

# Librarians of the Peruvian forest

*Oliver Phillips*, **a biologist at the Washington University in St Louis, USA, reports on efforts to sustain and spread indigenous medicine, health care and forest management skills in the forests of south-east Peru.**

D. PELUSO

More and more people have recently come to appreciate that the present biodiversity crisis is intricately linked to an equally acute crisis, the loss of cultural diversity. In a fitting metaphor, tropical forests have been likened to libraries of rare books, and the forest people to librarians. The implication is clear – even if efforts to conserve at least some forest succeed, we are in danger of finding ourselves with only a few clues as to how to use the vast stocks of tropical diversity.

Somewhat paradoxically, cultural diversity is often being lost fastest precisely where human populations are growing most rapidly. In the region of Madre de Dios in south-east Peru, for example, displaced settlers from the Andes are flooding into Amazonia along rivers and roads. In their desperate search for land to cultivate, they threaten the ability of the surviving indigenous people to maintain their cultural identity. However, while such rapid change brings with it the threat of ecological and cultural destruction, it may also have some benefits. Significantly, native groups in Amazonia are establishing improved links with one another, and are now better prepared than at any time in the last 500 years to deal effectively with the outside world. As a result of the threats and opportunities that change is bringing, increasingly sophisticated grass-roots organizations have sprung up that promote the common interests of indigenous peoples.

One such group in eastern Peru is AMETRA (Aplicación de Medicina Tradicional), which is reviving traditional plant remedies as a response to the serious health problems of indigenous communities caught between half-forgotten traditional cures and expensive, sometimes inaccessible, modern medicines. Originally founded by a Shipibo shaman in the neighbouring department of Ucayali, it now also operates in Madre de Dios, under the auspices of FENAMAD (Federación de Comunidades Nativos de Madre de Dios). Its principal base here has been on the 20 km$^2$ of land of the Ese-eja indigenous community Infierno that overlaps with the Tambopata Wildlife Reserve, itself an increasingly threatened area of forest with world record species numbers of birds and butterflies, and as many plant species as the whole of the British Isles. The dual allocation of land to both wildlife reserve and native community is the result of a bureaucratic mistake, and potentially a source of antagonism. However, since AMETRA assumed responsibility for the land in 1987, this potential people/wildlife conflict is apparently resolved, and for the time being at least, the needs of both people and wildlife are being met.

Several native communities have contributed to building an Ethnobiological Centre that runs an active ethnobotanical and agroforestry research programme side-by-side with training courses in traditional health

OLIVER PHILLIPS

**Far left:** *Women preparing medicine from forest plants.*
**Left:** *Edible wild fruit from Tampobata which could supply calories and vitamins to local people.*

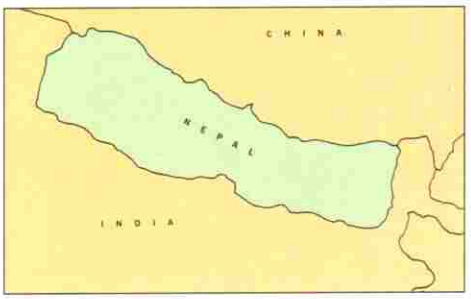
care, and practical work in establishing medicinal plant nurseries and gardens. A particular emphasis has been on the protection, cultivation, and promotion of an anthelmintic fig tree species known as *Ojé* (*Ficus insipida*). Taken orally, the latex of ojé is a powerful cure for intestinal parasites, which affect more than 90 per cent of children in many Amazonian communities, frequently leading to death from loss of salts due to diarrhoea. Ojé latex is an excellent example of a traditional medicine that could confer enormous health-care benefits: the tree grows rapidly, cures a widespread and potentially life-threatening condition at least as efficiently as expensive inaccessible pharmaceuticals, and is present through most of the humid lowland neotropics from northern Mexico to southern Amazonia. *Cocona* (*Solanum sessiliflorum*) is another underused medicinal plant promoted by AMETRA; this tomato relative is easy to cultivate, and produces large quantities of a nutritious fruit that is exceptionally rich in vitamin C and iron and hence recommended to counter anaemic conditions.

The centre acts, in effect, as an indigenous university and community centre rolled into one, where people can learn and exchange information on herbal and shamanic forms of traditional medicine, as well as forest management and agroforestry, and where outsiders can conduct applied research into local ecology and ethnobiology together with native colleagues. Through this broad approach, this indigenous initiative has gained a diverse array of advocates and supporters elsewhere that includes both individual scientists and conservation groups in Peru, the United States and Europe, without relinquishing control of the pace and style of development to outside interests. (Groups that have funded AMETRA's activities include WWF-US, WWF-UK, local Friends of the Earth groups, the New York Rainforest Alliance, and the Peruvian Foundation for the Conservation of Nature.) Recently, AMETRA has garnered further support, to hire medicinal and anthropological consultants as part of an ambitious project to teach integrated traditional and preventive health care in isolated communities in the Manú Biosphere Reserve.

Successful as projects such as those established by AMETRA can be, it would be naïve of conservationists to think that they offer a panacea to accelerating deforestation. FENAMAD and AMETRA by their very nature only address the problems of a small minority of the rural population in Madre de Dios, most of whom are *mestizos* of mixed racial origin, often recent migrants from the Andes. Satellite images clearly show that *mestizo* smallholders are causing much of the region's current burst of deforestation, and any serious effort to reverse this trend will succeed or fail on the basis of how well the needs and aspirations of these people can be met.

For conservationists, then, the main significance of the indigenous movement in the long-run may be as a kind of 'cultural nucleus', from whom the *mestizo* majority may eventually adopt some of the necessary technology for making a sustainable living in the difficult tropical forest environment. Without the example of some people living relatively harmoniously with their surroundings, the new migrants would have little hope of developing the necessary techniques and attitudes in time before vast areas of forest are destroyed. If a process of reverse acculturation eventually occurs, in which the more 'sustainable' ecological attitudes and technologies of the remaining native people become accepted and understood by immigrants, it will be in no small part due to the efforts of indigenous people in maintaining and promoting their culture. ■

# Tigers and people: partnership for survival




*Stephen Mills* **reports on the latest effort to overcome the growing tension between migrating farmers in Nepal and the tigers and rhinos which have flourished in Chitwan National Park.**

Every January 80,000 villagers wade the Rapti and Narayani rivers in southern Nepal to cut the grasses of the Chitwan National Park. For two weeks they are free to keep what they can carry.

Men, women and children stagger back and forth across the muddy waters with mountains of bundled grass on their heads. They load up precarious canoes, fill their bullock carts, cover their bicycles. The grass is a vital resource. It makes fences for livestock, roofs for huts, walls for daub and wattle houses. The new shoots are gathered for fodder, the most flexible stems are shaved and weaved into baskets.

It is a harvest almost worth dying for – and every year some of those harvesters do die. For in the Chitwan's vast swathes of 20-foot high elephant grass and its dense riverine forests of sal and trewia a rhinoceros or a tiger can be fatally invisible.

Until very recently, however, a sort of truce existed between man and animal. The grasslands and forests were a shared commodity. Villagers sent their cattle into the woods. The cattle returned with milk for the table and manure for the fields. If a tiger emerged from the forest to lift a bullock or if a rhino blundered across the river to raid a crop this was, to some extent, accepted as a quid pro quo.

In that admirable Asian way, a sophisticated and populous human society evolved without eradicating the ancient megafauna of the region. The rhinoceros was respected and the tiger was revered. But times are changing and Chitwan may no longer be such a safe haven.

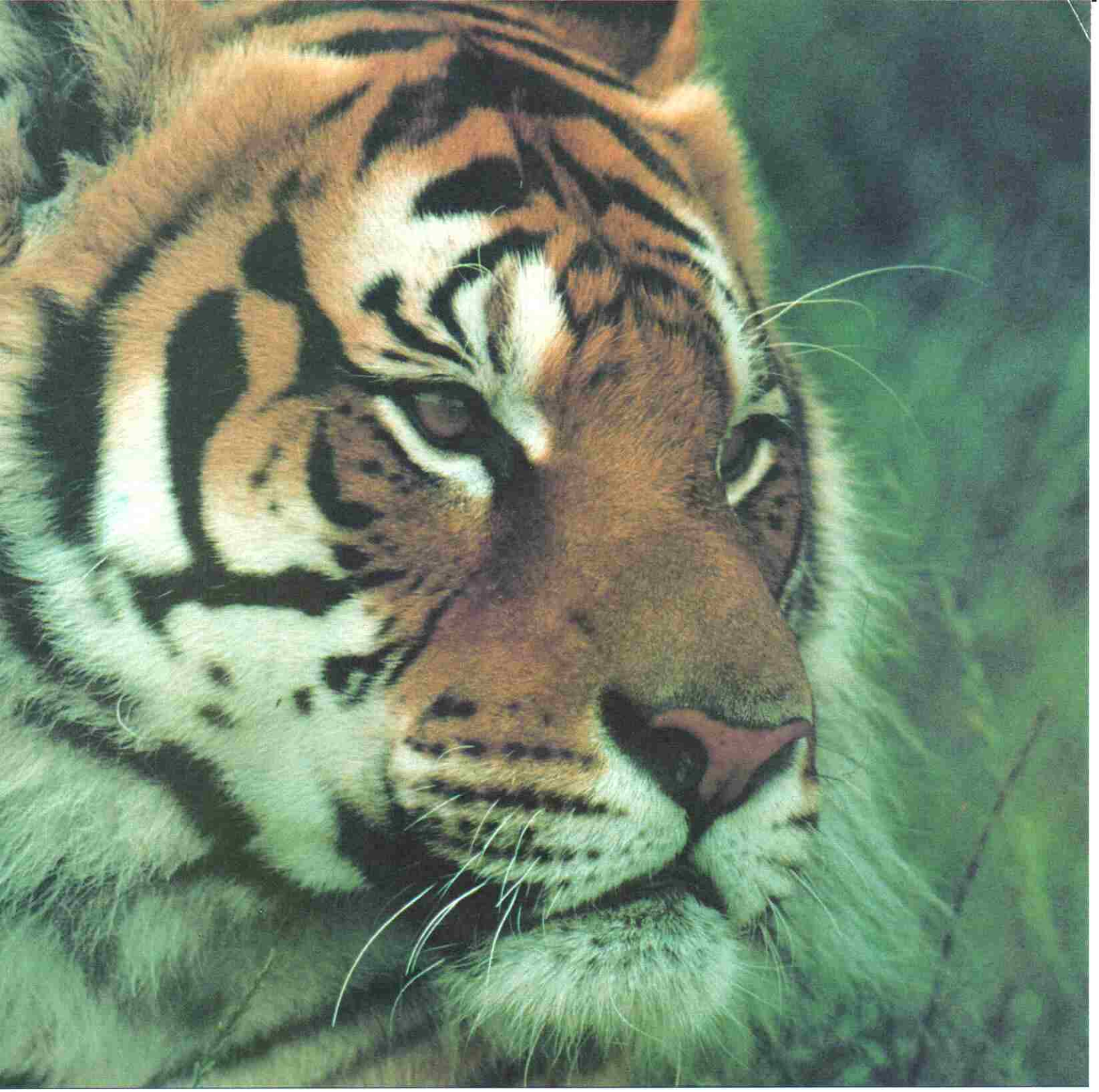
Chitwan is one of the world's truly beautiful places. In the early spring mornings the mists fall like rain against the heavy sal leaves, then rise and burn off with the sun to leave the air fresh and still. In the distance the astonishing frosted outlines of the Himalayas appear, in the foreground the red flowers of the silk cotton trees glow like painted lights.

For centuries its herds of spotted deer and sambar, its leopards, jungle cats, and fishing cats, its monkeys, crocodiles and kingfishers were protected by the malarial mosquito. Only the malaria-resistant Tharu people, refugees perhaps from forgotten wars in Rajasthan, were able to settle there and the area was otherwise protected as a hunting reserve for Nepal's ruling Rana family.

In the 1950s the Chitwan valley still comprised 1,000 square miles of virgin forest and grassland. Serious erosion in the hills to the north, however, forced hungry farmers to migrate down towards the jungle, and the Nepalese government began an effective programme of malaria eradication. By the late 1960s two thirds of the wilderness had been cleared and colonized. In 1973, 210 square miles were set aside as a National Park – primarily for the very rare one-horned rhinoceros – and this area has subsequently been added to.

HENRY AUSLOOS/WWF

The park has been a success. I was filming rhinos there a few weeks ago and noticed that almost every eligible female had a calf in tow. Almost wherever I set up to film, I noticed on returning the next day, that a tiger would have left its prints during the night and I was aware of at least four different females with cubs within a few miles of my base.



Unfortunately, however, the 'partnership' between the wildlife and the local people is beginning to wear thin. Each year the numbers of grass-cutters increase, as people travel from further and further afield. Each year croplands press closer against the boundaries of the park and more and more rhinos are tempted out of the forests to raid them.

The pressure on woodland outside the park has reached breaking point and dissatisfied villagers are eyeing the great stands of timber that are still protected within. Worst of all, perhaps, the poachers have returned with their guns and traps, killing rhinos for their horns and tigers for their bones. At least 15 Chitwan tigers and perhaps the same number of rhinos have been slaughtered since 1989.

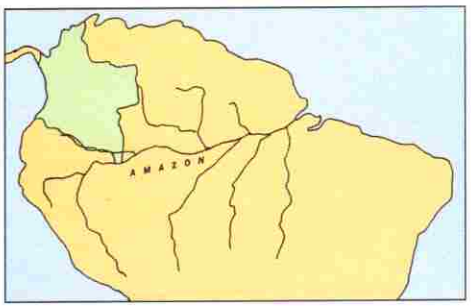
The Nepal Government is responding with some wise initiatives, for instance, diverting funds into community forest schemes that will provide wood and grazing for livestock as well as a barrier to protect crops from rhinos. They are instituting a law requiring half of all revenues earned from tourists in the park to be ploughed back into local projects so that the park is once again seen to be of direct value to villagers. They are also offering rewards for information leading to the arrest of poachers, a trick that has been successful in the past.

The pressures on tigers and rhinos are bound to increase. Their survival depends not merely on legislation but on the consent of the people who live around them. They, the local farmers and villagers, will always be willing to enter the Chitwan National Park to cut the grass. What matters is that they are willing to leave it again when they have finished. ■

*Stephen Mills wrote and photographed the BBC film* Man-Eater: To Be or Not To Be *on tigers in Nepal in 1992. He is currently filming rhinos there for a new David Attenborough series on plants. He is chairman of the International Association of Wildlife Film-makers.*

# Learning from the dolphins

**Whales and dolphins have, for some time, been used as 'flag species' by organizations working for the health of the oceans. Now the Amazon river dolphin is becoming a symbol of the struggle to protect the aquatic systems of Amazonia.** *Sarita Kendall* **reports.**



SARITA KENDALL

*Two pink Inia dolphins – the larger of the two Amazon species, which can reach a length of 2.5 metres.*

Puerto Nariño, upriver from Colombia's main Amazon port at Leticia, is just one of hundreds of small towns where a fast growing population with 'modern' needs is putting enormous pressure on resources in the surrounding forest, rivers and lakes. The Indians and *mestizos* want to buy white bread, liquidizers and outboard motors, and they want to send their children to primary (or even secondary) school.

This requires money, not just subsistence, and there are few options – commercial fishing, lumber extraction, temporary construction work or a job with the municipality. Animal trafficking and the sale of animal skins brought significant income at one time, but caimans, otters, jaguars and manatees are rarely seen nowadays.

The gardens where manioc, maize and fruit are grown have become less productive because the forest is not allowed to recover for long enough. Trees along the river's edge are often cut down to improve access – in the past a belt of vegetation bound the soil, protecting the banks and providing seeds and berries for fish to feed on. Most of the hunting and fishing taboos which helped regulate the size, sex and number of animals killed have collapsed, while conservationist folklore is being forgotten.

Dolphins, however, have a special place in Amazon folklore – numerous stories recount how people turn into dolphins, and vice versa. They are enchanted animals living in underwater cities and they inspire respect; such traditional beliefs have given them some protection but there is also a trade in dolphin teeth, eyeballs and genitalia for use as amulets. In some parts of the Amazon dolphins are killed for this purpose, though many more die 'accidentally' in fishing nets.

The dolphin is one of the top predators in the rivers and floodplain lakes around Puerto Nariño and plays an important part in promoting species diversity. People believe that the bigger of the two dolphin species, the Amazon river (or Inia) dolphin, eat the same fish as they do and steal their nets – the smaller Tucuxi dolphin is not considered to be a competitor. In fact, both species eat a very wide range of fish, many not consumed by local families.

The over-fishing problem in the Puerto Nariño area is now recognized and discussed by everyone. Nylon lines and nets are replacing the spears and harpoons which were aimed at full-grown individual fish. Although nets are officially banned from the lakes where many species spawn, only recently have the authorities begun to try and enforce the ban. Tiny arowhanas – which can grow into large fish for eating – are captured in their thousands and shipped abroad for aquaria, with a high percentage dying on the way.

The floodplain lakes play a crucial part in the life cycle of fish and dolphins, and the ban on nets benefits both. A dolphin research and conservation project based in Puerto Nariño has reinforced this point and others – for example, the fact that dolphins eat species that prey on the eggs and larvae of gamitana and pirarucú, two much-prized fish that are growing scarcer.

The recent popularity of dolphin watching among ecotourists and the sale of dolphin wood carvings have also led people to value dolphins as a resource. However, all this has only been achieved with an intensive effort in a limited area. Aquatic fauna and their habitats are threatened on a vast scale in the Amazon – by hydroelectric dams, oil exploitation, gold mining, urban and industrial waste, farm chemicals, irrigation projects and deforestation. The striking river dolphin can be used to help the understanding of ecological relationships and raise awareness of these problems locally and internationally. ■

# Emperor of the Forest

TORBEN B LARSEN

**This giant Emperor Swallowtail (*Papilio lormieri*) in Kenya's Kakamega Forest, one of the last remaining lowland rainforests in that country.**

**It is a living indicator that the forest is in relatively good shape: the Emperor Swallowtail lives only in rainforest and does not take kindly to forest degradation. It is also a biogeographical indicator, since it is a member of the fauna of the main equatorial rainforest zone at the easternmost limit of its range. Another similar species replaces it in West Africa, and yet another in the coastal rainforests of East Africa.**

**The coastal rainforest now exists as isolated patches of forest in otherwise savannah country, and these almost all have their own distinct subspecies. The Swallowtail thus also becomes a conservation indicator, showing that these isolated forests have for long had their own evolutionary history.**

**Butterflies are also good indicators of biodiversity and centres of evolution. There is a small mountain in Cameroon where 800 different species have been recorded – more butterfly species on 200 km² than in Europe or North America. Totals of 400 to 500 is a more usual figure, but very few forests have been studied in depth. There are isolated mountain forests in East Africa where many of the species are found nowhere else.**

**So far mammals and birds have been the focus of conservation efforts. Butterflies have a role to play as well. They are the only large insect group in most of the tropics that is sufficiently well known to serve this purpose, and they may lead to the identification of critical habitats that have so far been overlooked in conservation planning.**

*Torben B Larsen*

BOTH PICTURES: STURE KARLSSON/WWF

# Cranes, rivers and people

**When rivers like the Platte in North America or the Indus in Pakistan cease to flow freely, the cranes which depend upon them are threatened. But, says *Kenneth Strom*, so are the people.**

"Why do you want to save the cranes?" This was the question the Pakistani boy from the nearby village asked as we gazed across the broad Kurram River. "Why aren't you trying to save my people who are suffering in Afghanistan?" he persisted. Although I could not explain it adequately when I first met him four years ago, I wanted the teenage Irfan to understand that in a very fundamental way I believed that saving his country's cranes would ultimately contribute to the survival and wellbeing of his people as well.

The Indus River system, including its Kurram River tributary, is the focus of a partnership between the Govern-

**Left:** *The Eastern Sarus Crane, native to the Mekong Delta.*
**Far left:** *The endangered Whooping Crane, found in Arkansas and Texas.*

ment of Pakistan and the National Audubon Society, one of the largest private conservation organizations in the United States. The partnership has developed through the Sharing the Earth project, which is an effort to find solutions to the shared problems of human population impacts on wildlife resources. Pakistan's work on the Kurram River was linked with Audubon's work on the Platte River of North America because of mutual concerns over human impacts on river resources and their associated bird populations, especially migrating cranes.

After only 150 years of agricultural development, the Platte River has been reduced to a mere shadow of its former glory as one of America's great prairie rivers. As the population along the Platte grew, most of the land was brought under cultivation, and more and more water was drawn from the river to irrigate every more farmland. Today the diversion of water from the river has reduced flows in the central Platte by over two-thirds. The visible effect of this reduction has been a shrinkage of the river channel and its fringe of wetlands. This in turn has caused migratory waterfowl to abandon long stretches of the Platte and to crowd into the only remaining areas of suitable habitat.

Two of the species impacted by the changes in the Platte are the Western Hemisphere's only two species of cranes, the Sandhill Crane and the Whooping Crane. Interestingly, these two related species have reacted quite differently to human impacts on the Platte and elsewhere in their range. The grey Sandhill Crane is today, by most accounts, the most numerous crane on earth, while the white Whooping Crane is the rarest and most endangered of the world's cranes, numbering fewer than 150 in the wild.

The cranes are an ancient group of large, long-legged, long- necked wading birds. Of the world's 15 species, seven are endangered. The most endangered tend to be the white, or largely white, species. This correlation is no accident, since the white cranes are the ones most closely associated with vast expanses of open grasslands and marshlands. Typical of this group, the Whooping Crane is fairly intolerant of people and the disturbances they cause. Although the Great Plains of North America would not be considered crowded by most standards, almost all of it has been converted to human agriculture, and most of its wetlands have been drained or filled. These changes, along with the presence of humans throughout, have made much of this region unsuitable for Whooping Cranes.

Sandhill Cranes, on the other hand, seem to tolerate a reasonably close association with humans. But even the Sandhill Cranes are now reaching the limits of their ability to survive amidst expanding human populations and their seemingly unquenchable thirst for Platte River water. Today there is barely enough water left in the Platte to maintain sufficient open channel and wetland habitat for the needs of the Whooping Cranes and some 500,000 Sandhill Cranes.

The Indus River of Pakistan is a river system that has supported a human civilization for over 5,000 years. Today much of Pakistan's rapidly growing human population of over 120 million depends on the Indus system for its water. Consequently, most of the land along the Indus and its tributaries is inhabited by people and has been converted to human uses. Like the Platte River, the Indus and the Kurram also provide important habitats for migrating cranes, including two fairly numerous species: the mostly grey Common Crane and Demoiselle Crane.

Although these species are quite tolerant of a moderate human presence, their use of the watershed has become confined to a few of the least disturbed habitats, particularly along a small reach of the Kurram. This situation has made them vulnerable to intensive hunting of the cranes (live-trapping), which is practised by the people of this region including the men of Irfan's village. In recent years the cranes' numbers on the Kurram have declined, and the severely endangered population of white Siberian Cranes which migrate across this region have been nearly extirpated.

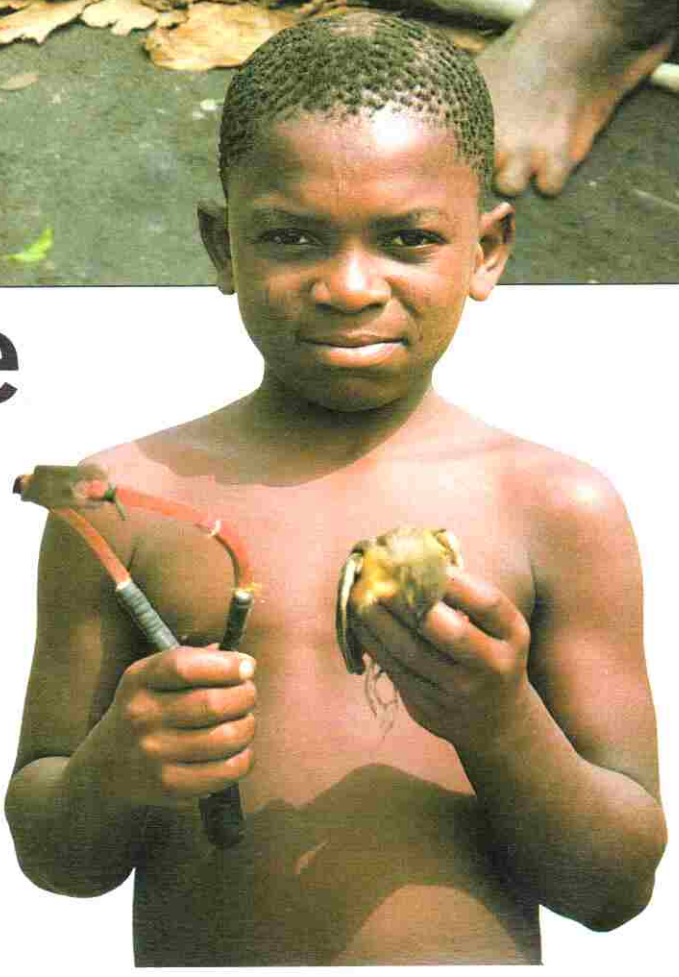
Along the Kurram River cranes have declined as a direct result of growing numbers of people and the disturbances they bring to the birds and their habitats. Yet the river habitat itself is in much better condition than the Platte, simply because it has not been subjected to the consumptive demands of intensive irrigated agriculture. Along the Platte intensive irrigation threatens crane populations even though the human population is deceptively sparse – "deceptive" because the true population that impacts the Platte's cranes is the population that drives the market demand for agricultural goods from this highly productive region.

Today an interesting development is emerging in the apparent conflict between human and wildlife uses of the Platte's water. Cities on the Platte are expressing concern that there may not be enough water for people's domestic needs if more water is removed for irrigation. The flows being requested by the cities are very similar to the flows that biologists have said are needed by cranes and other wildlife. It may be that as we approach the limits of a resource such as river water, the shared needs of people and wildlife become more important than their apparent conflicts, and saving enough for one of us also provides enough for the other.

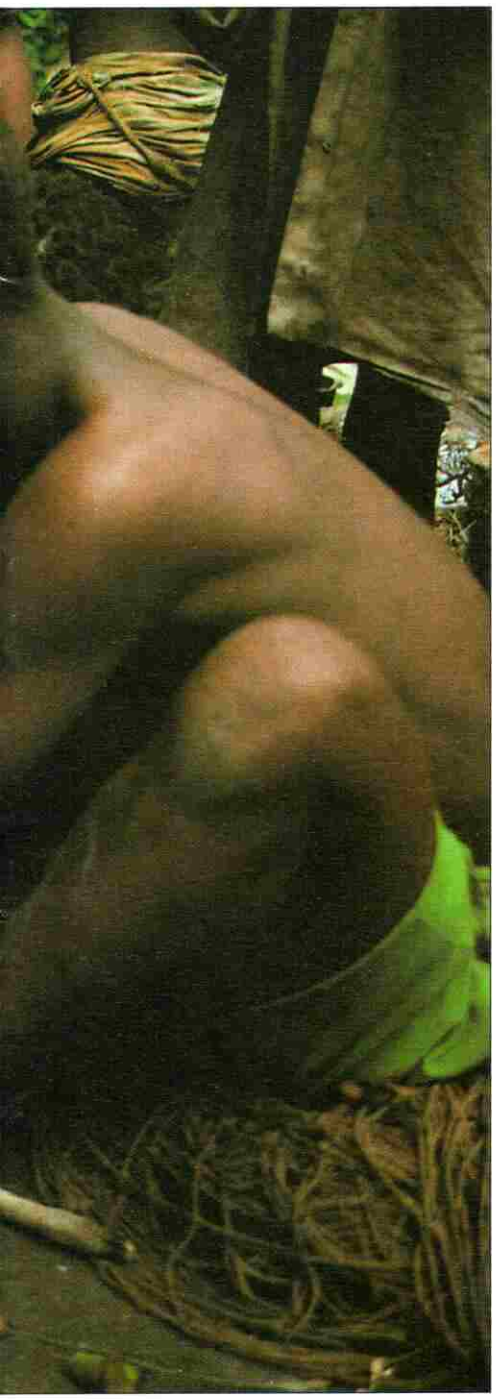
The recent establishment of a protected area on the Kurram River holds new hope for Pakistan's cranes. As the region's agriculture develops, however, this hope will be short-lived unless the people apply the lessons being learned on the Platte. When wildlife, like the cranes, suffer from a shortage of water, it appears that humans will soon face the same limits. But if we can protect adequate supplies of flowing fresh water for cranes, we will almost surely be able to provide a healthy water supply for people as well – along the Kurram, the Platte, or any other river we share. ■

*Dr Kenneth Strom is Director of the Rowe Bird Sanctuary at Gibbon, Nebraska, USA.*

# Using wildlife sustainably



**Recent concern of whales and elephants has heightened controversy over the hunting and use of wild species. Here *Dr Martin Holdgate*, Director-General of the World Conservation Union (IUCN), comments on the rights of the hunters and the hunted, and reports on a new initiative to resolve the conflict.**



**Left:** *It is the young Pygmy boys' task to skin and butcher game caught in the hunt. Ituri Forest, Zaire.*
**Below:** *Near Cross River National Park, Nigeria: boy with bird he has shot with a catapult.*

People have hunted and fished since the remotest antiquity. Indeed, some writers have speculated that it was through hunting animals as large as ourselves that our species learned teamwork, was impelled to develop better weaponry, and gained the high-protein and high-energy diet that aided its dominance.

If we expand the definition of 'wildlife' to embrace all non-domesticated and non-cultivated plants and animals, human dependence on it for food, fibre, medicines, latex, timber, fuelwood, skins and many other essential products is obvious. Even today, in Botswana, some 40 per cent of the total animal protein intake of many rural peoples comes from wild animals: in Nigeria the figure is 20 per cent. Many coastal peoples derive a far higher proportion of their protein from fish and shellfish. Some 40 per cent of the pharmaceuticals traded across the counter in North America contain active substances originally located in wild plants. In rural areas in the developing world, herbal medicines of this kind predominate. Crop breeders continually turn to wild relatives of our cultivated plants for genes that strengthen resistance against disease, or aid adaptation to new situations.

Even this merely scratches the surface of our dependence on wild nature. The oxygen we breathe is renewed by green plants. Forests and wetlands regulate the run-off of water from the hills. Coral reefs, mangroves and salt-marshes shield the coasts from storms. The climate of large areas – such as the Amazon Basin – is greatly influenced by the vegetation cover. Deforestation and desertification march hand in hand.

So – why is there such a controversy today over sustainable wildlife use? I suggest that it has two principal roots, one practical and one ethical.

The practical point is that *unsustainable* use of wildlife has done unquestioned damage to the balance of many ecosystems and contributed to environmental degradation and human misery. Erosion, deforestation, overfishing and the excessive slaughter of species as different as whales and elephants have fuelled justified protest. The fact that misuse of such resources is not new – our remote ancestors almost certainly caused the extinction of mammoths, mastodons, giant elk, and the larger Australian marsupials – is neither here nor there.

The ethical point is more difficult. As people have moved away from their rural roots, and become both urbanized and relatively wealthy, attitudes to wildlife have diverged. While indigenous peoples and many other hunters have respected wild animals and supported conservation, many urban people who also delight in the beauty of wildlife relish the fact that they no longer have to kill it to live. They find hunting of wild animals for pleasure repugnant, and are unhappy about any commercial use of wild species.

The dichotomy is wide and growing. It separates peoples with different lifestyles, and especially dwellers in urban and rural societies. In rural areas of developing countries, the choice is often not between conserving wildlife or using it, but between living off wildlife or replacing it by cattle and sheep. And the denial of markets for wildlife products, or of the right to allow hunters to pay for taking trophies, may deny indigenous and rural peoples one of the few economically valuable resources available to them. Such denial, in turn, may erode conservation because it eliminates the economic value of the wildlife and hence the incentive to maintain it.

The problem of unsustainable use can be dealt with by substituting better, sustainable, practices. I described the ethical question as more difficult because out-and-out opposition to the use of wildlife cannot be thus resolved. IUCN, with UNEP and WWF, has consistently supported the principle of sustainable use. The *World Conservation Strategy* of 1980 and *Caring for the Earth* of 1991 alike argued that such use was acceptable provided that exploited species and populations were not endangered, and habitats and ecosystems were not disrupted. In 1993, following a Recommendation of its General Assembly, IUCN is preparing new guidelines for sustainable wildlife use. We believe that if these are followed, the destructive over-exploitation of wild species will stop, and the benefits such species can provide will be enhanced.

The guidelines will not help those who want to see *no* consumption of wild species. They have a right to their views. Where they are the majority, as they may be in some countries where wildlife (apart from fish) is no longer exploited for essential food, they may indeed secure protection for their national mammals and birds, perhaps even including so-called 'pests' of agriculture. But over much of the world wildlife use is an essential foundation for the welfare of communities already suffering from poverty. The guidelines will, it is hoped, help them to manage these resources so that they remain a valuable asset for the future. ■

BOTH PICTURES: SANDRA MBANEFO/WWF

# How many migrants for Europe?

I recently travelled to Rome to advise the Italian Government about the prospect of fast-growing numbers of migrants, both legal and illegal, flocking from North Africa and the eastern Mediterranean into Europe, many of them making Italy their first port of call. Why are the Italians concerned? Today they are playing host to at least 700,000 such migrants, and they fear that the present influx of almost 100,000 per year is only a trickle as compared with the totals that could lie ahead. Other European countries should also be concerned. In principle, when a migrant sets foot in Sicily there is little to prevent him or her from heading for Scotland (or any other part of the European Community).

Regrettably, amid recession and unemployment, immigration in several parts of Europe has become a focus for intolerance and discord, and fuel for political extremism. European governments, in response to public opinion, are seeking to regulate immigration. They are concerned too about the challenge of supplying future employment for their young people (though this is a problem they should be doing more to address anyway, while immigrants generally do work that Europeans no longer want to do).

This article does *not* assert that the immigrant phenomenon should be perceived as some sort of threat. Indeed, Gadfly believes that heterogeneity can often prove beneficial in the long run: where would the United States, Canada and Australia be without their immigrant histories? The prospect is, however, that without measures of exceptional scope and urgency, Europe may have to accommodate growing numbers of newcomers – or try, surely unavailingly, to adopt a Fortress Europe stance. In the circumstances, I believe political leaders will have to do more than focus on symptoms of the problem (if problem it is) and tackle its sources.

While certain of the migrants are drawn by hope for a much enhanced economic life in Europe, many are driven by the terrible twins of population growth and environmental rundown.

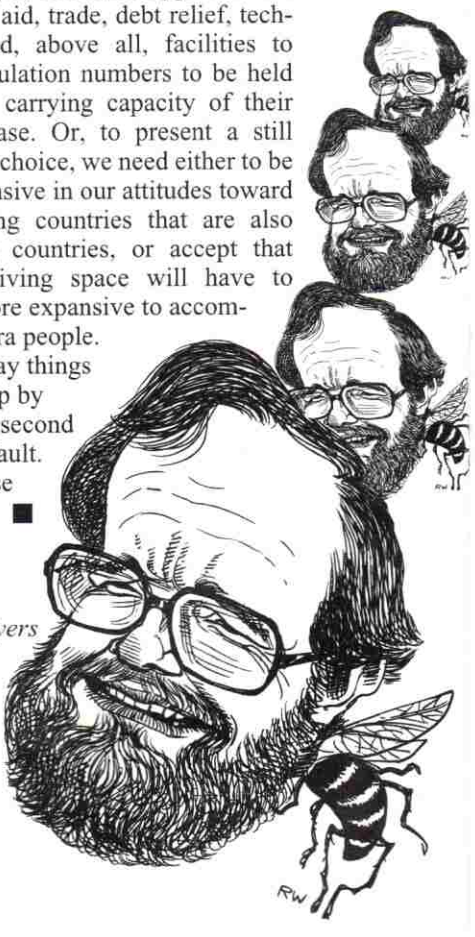
Today the five countries of North Africa and another five countries of the eastern Mediterranean comprise 211 million people. The total is projected to reach 298 million by 2010 and 376 million by 2025, for increases of 41 and 78 per cent. The present European Community comprises 349 million people, projected to decline in natural-growth terms by 10 million people by 2025. Certain of the 10 developing countries have done well in reducing their population growth rates: Tunisia's is 1.9 per cent per year, one of the lowest in the Muslim world. But the three largest, Egypt, Syria and Turkey, still have rates way above 2.0 per cent (Syria's 3.8 per cent). Fortunately there is much scope in several countries to bring down the birth rate. The unmet need for family planning in Tunisia is 18 per cent and in Egypt 26 per cent.

Partly if not largely because of population pressures, environments are declining in all countries. Morocco, Tunisia and Libya are each losing around 1,000 square kilometres a year to desertification. In Egypt, which will soon have to import almost three-fifths of its food and is critically dependent upon irrigation, half of its irrigated croplands suffer from salinization and one-twelfth of agricultural production is lost to desert encroachment. In Turkey, more than 150,000 square kilometres of farmlands have been severely damaged through soil erosion.

Rapid population growth has also aggravated problems of unemployment and underemployment. In Morocco, economically one of the more advanced countries with a per-capita GNP of $1,050, these problems are officially recognized to be 17.5 per cent and 22 per cent respectively, and the unofficial figures would surely be at least one quarter as high again. By 2025 the labour force of Western Europe is projected to fall by 14.5 million workers, that of North Africa to expand by almost 57 million. Even if North African economies grow at a rate to absorb many more workers (their collective GNPs are only 3 per cent those of the European Community), there will still be a large surplus of job-seeking people – and the boat contractors taking migrants across the Straits of Gibraltar or of Medina are little likely to rank among the unemployed.

The principal answer is two-fold. First, it is in Europe's long-term self-interest to support family-planning efforts in countries concerned. European nations' funding for population-related programmes in developing countries is rarely more than 1 per cent of their foreign aid. Secondly, they can do far more to foster development of sustainable sort in all countries, whereupon, as a spin-off benefit, they will help economies to expand faster than expected and thus to generate many more jobs. As part of this strategy, European nations could export a host of lower-paying manufacturing jobs to North Africa and the eastern Mediterranean, along the lines of what the United States is doing through its beefed-up investments in Mexico – provided of course this did not entail the export of polluting industries to take advantage of economies with fewer environmental safeguards.

It might seem to go against the grain of our economically straitened times to propose that Europeans should export employment of any kind But the trade-off is increasingly clear: export jobs or import people. The same applies to the 'export' of aid, trade, debt relief, technology, and, above all, facilities to enable population numbers to be held within the carrying capacity of their resource base. Or, to present a still more basic choice, we need either to be more expansive in our attitudes toward neighbouring countries that are also developing countries, or accept that Europe's living space will have to become more expansive to accommodate extra people. The first way things will develop by design, the second way by default. Let's choose to choose. ■



*Norman Myers*

# Associates' News

## People and plants

In July, the World Wide Fund for Nature (WWF), UNESCO and the Royal Botanical Gardens in Kew (London), celebrated the completion of the first year of their joint People and Plants project. This draws on the centuries-old knowledge of plants built up by local communities, in order to contribute to the sustainable and equitable use of these resources in the future.

NATHANIEL QUANSAH/WWF

*Preparing a local treatment for common cold, Madagascar.*

One of their joint projects, helping Madagascar to open its first medicinal plants health care and research centre, is reported on page 16. Elsewhere, WWF and its partners are enlisting the help of three groups of indigenous peoples in Mexico to help them record (so far) 3,000 species of useful plants. They are also working alongside tribal forest dwellers in Malaysia and Indonesia to learn how they harvest on a sustainable basis one of the world's most useful plants, palms.

Under the guidance of a joint steering group, ethnobotanists are setting up training workshops for local communities, helping them establish residential centres and herbariums, and to manage protected areas.

Working with regional, national and international partners WWF is suggesting ways of marketing locally-produced plant products and tracking down unregulated trade that is driving some species towards extinction.

Emphasizing the integral links between cultural and biological diversity, this project aims to record traditional knowledge for the benefit of local people and the environment.

It is backed up by WWF's new informational campaign, People for Nature/Nature for People, which features the People and Plants Programme as the first in a series of four informational packs which explain how WWF is fostering community-based conservation.

■ *Contact: Elizabeth Kemf, Conservation Editor, WWF, CH-1196 Gland, Switzerland. Tel: (4122) 364 95 57, Fax: (4122) 364 53 58.*

## Woman's rights and reproduction

The time has come for health professionals and the international family planning community to make women's reproductive autonomy a genuine human right and set standards for its enforcement, say Lynn Freedman and Stephen Isaacs, in the Population Council's *Studies in Family Planning*. They say three international conferences – to consider human rights in 1993, population in 1994, and the status of women in 1995 – will help set the agenda for the remainder of the decade.

Two important issues to be confronted in developing these international standards are the tension between demographic priorities and reproductive choice, and how international standards and local customs and religion conflict. The authors also emphasize that if a reproductive health-care programme is going to be successful and acceptable to women, it must be based on a genuine concern for the wellbeing of women and not on population and demographic goals. Freedman and Isaacs believe that concerns about population growth and women's health and wellbeing can be addressed simultaneously, but that the priority these concerns are given will have a profound effect on policy design and service delivery.

The development of a legal framework for enforcing reproductive rights is an important first step, but the authors state that only when the idea of reproductive autonomy as a woman's basic right influences the structures of government, health-care systems, and the behaviour of women and men will real change begin.

■ *Contact: Lynn P Freedman, Director, Reproductive Rights Project, Columbia University, New York on (212) 781-8831, or The Population Council, New York, Tel: (212) 339-0500. Fax: (212) 755 6052.*

## Spreading the word

More and more international and national programmes are now recognizing that communication and mass media activities are not just a support activity but often integral to the success or failure of family planning and population projects. Celebrating the 10th anniversary of its Population Communication Services (PCS) project, the Johns Hopkins University (JHU) has produced a special annual report on the project.

JHU/PCS is working to increase the impact of communication interventions and to create environments where family planning can really become a household word, a community norm, and an informed individual choice.

During 1993 innovations towards these goals include the development of computer-based training and software called Strategic Communication Options for Planning and Evaluation; The Java Trilogy films in Indonesia, the first of a number of Enter-Educate projects that show links between population, environment and sustainable development; and the Jiggasha Approach, a new emphasis in Bangladesh on woman to woman communication that combines village networks with media and entertainment.

"No longer a 'spare wheel' on the vehicle, communication is increasingly seen as a 'steering wheel' for both broad-based and segmented activities," says JHU/PCS.

■ *Contact: JHU/PCS at 527 St Paul Place, Baltimore, MD 21202. Tel: (410) 659-6300, fax: (410) 659-6266.*

## Caring for the Earth

The IUCN holds its 19th General Assembly in Buenos Aires on 18–26 January, 1994. This major triennial get-together of governmental and non-governmental organizations working on the issues of environment and development will, next year, focus on 'Caring for the Earth and its People'.

Based on last year's World Conservation Strategy document, the meeting will consider, among other things, the tricky issue of the Earth's 'carrying capacity', or how many people the planet can sustain given the present and likely future patterns of natural resource use.

Other topics for discussion will include the implementation of the Convention on Biological Diversity, reform of the world's economy and its trading system, the sustainable use of living natural resources and the strengthening of international policies and conventions for sustainable development.

As the first global meeting of IUCN members since the Earth Summit it will be a unique opportunity to put that event into perspective.

## Desert war

The first steps towards the framing of a Convention to Combat Desertification, as agreed at the Earth Summit last year, were taken at a meeting of the International Negotiating Committee in Nairobi, in May, reports Camilla Toulmin of the International Institute of Environment and Development (IIED).

There was considerable agreement among government representatives that the countries suffering from desertification needed to make serious socio-economic commitments in areas such as land reform, demographic policy and the decentralization of power. In turn, the donor governments would need to increase the quality and co-ordination of their aid flows, even if additional financial support was not forthcoming.

It now seems likely that the drafting of the Convention will continue on twin tracks: a broad document, covering global issues, and a separate text including regional protocols.

The urgency of the issues as they affect Africa is well set out by Michael Bernard Kwesi Darkoh, Professor of Geography at Kenyatta University, Nairobi, in the April issue of *Tiempo*, a joint publication of IIED and the University of East Anglia (UK).

He says 65 per cent of Africa is made up of drylands, and an estimated 34 per cent of the continent is threatened with desertification. One reason is cycles of drought. Another, more important, reason is human and animal population pressure.

The arid and semi arid areas are having to feed an additional 12 million people every year, good weather and bad. This "translates into overexploitation of water, land, forest and pasture through overcultivation, overgrazing, deforestation and poor irrigation practices. The resulting erosion and degradation of productive lands has led to food insecurity."

■ Tiempo, *which deals with issues of global warming and the Third World, is distributed by the University of East Anglia. Fax: (44 603) 507784.*

## Funny – and fast

Around the world, three babies are born every second. A new animated film by Carlo Bozetto shows them all – pink, yellow, white, brown babies – ricocheting off the Earth's surface and collecting into an ominous time-bomb.

The bomb explodes on the planet, resulting in a voracious human population chomping up the earth's resources, like an apple, until they have consumed it down to the bare core. A warning sign flashes on the screen – STOP! And

the slogan to avoid exploding human numbers? – *Don't be silly, wear a condom on your willy!*

(Bozetto's wry homily actually comes in two versions, to allow for degrees of religious sensitivity. In the first, as the babies bounce off the earth, the Pope appears in the right hand corner, blessing them. In the second, he doesn't.)

This is one of the series of 16 30-second spots, or Public Service Announcements (PSAs), which use a combination of wit, irony and humour to put out basic environmental messages to viewers whose attention span has been shortened by modern television techniques.

Imaginatively commissioned by the World Wide Fund for Nature (WWF) in Italy and already widely shown on Italian television, they are distributed by the Television Trust for the Environment (TVE) for broadcast use in developing countries and non-broadcast use worldwide.

All 16 PSAs come on one VHS tape. They include the things individuals can do to cut back on energy, water, pollution and packaging.

■ *Contact: TVE Centre for Environmental Communications, Prince Albert Road, London NW1 4RZ, UK. Fax: (4471) 586 4866.*

## Growing up

At the opposite end of the spectrum of new films is a documentary series called *Growing Up*, co-produced by TVE and the UK's Central Television.

The first film follows the stories of 10 children born in nine countries over the last year since the Earth Summit. It is followed by nine films telling the story of each of the children from widely varying backgrounds. The series aims to follow their lives, and that of their families and communities, for 10 years to see how the promise of Rio affects them, if at all.

A common theme running through the series is what one father (a fisherman in Rio) calls the trouble with Brazil: "Too few people with too much – and too many with nothing."

*Growing Up* is a big production number illustrating a simple truth: our common humanity. All the families yearn for just one thing – they want their children's lives to be better than theirs has been.

■ *Contact: TVE for distribution in developing countries. An education version for schools broadcasting may be obtained from WWF UK, Panda House, Godalming, Surrey GU 1XR. Tel: (+44 483) 426444, Fax: (+44 483) 426409. Other enquiries: Central Television, Growing Up, Box 96, Birmingham B1 2LJ, UK.*

## Parks Conference Report

The Fourth World Congress on National Parks and Protected Areas, held in Caracas last year, broke new ground by holding a major workshop on the impact of demographic change on such areas. A Working Report on that workshop has now been published.

One major paper, by James Ypsilantis, provides a demographic backdrop for the Workshop, and includes a report of a study of policy options in Madagascar. This shows that action on slowing population growth, by itself, is likely to have only a marginal effect in slowing the destruction of the last of the island's magnificent forests, with their wealth of unique species.

The pressure of people on agricultural land and the growing need for fuelwood means that if there is no change in consumption patterns, an effective population policy would merely delay forest destruction by a decade. But if this could be allied to the right energy and agricultural policies forest cover would decline only marginally and could be retained at something like 11 per cent of the land surface well into the next century.

■ Protected Areas and Demographic Change: Planning for the Future. *is available from IUCN Social Policy Service, Rue Mauverney 28, CH-1196 Gland, Switzerland.*

DAVID AUSTIN ROSES

## Happy Child

This year's Chelsea Flower Show, in London, saw the birth of an Old English style rose named 'Happy Child', dedicated to the work of Population Concern.

It was launched at the show by the environmental campaigner and Population Concern President, David Bellamy, who announced that every time a Happy Child rose was planted, a contribution of £1 would be made to the work of the organization and a world where every child is wanted.

The exceptionally rich deep yellow, fragrant rose, was created by David Austin.

■ *Readers wishing to order the 'Happy Child' should contact David Austin Roses, Bowling Green Lane, Albrighton, Wolverhampton, England.*

# BOOKS

## Sharing the planet

**The Diversity of Life**
Edward O Wilson
*The Belknap Press of Harvard University Press, Cambridge MA, 1992, $29.95 (hardback)*

How can a human species bent on habitat destruction built up over millions of years control its appetites and penchant for rapid extinction of other species? Edward Wilson, one of the world's leading entomologists and naturalists, has written a beautifully illustrated and designed book to demonstrate that our species and other life forms can mutually and productively share the same planet. Chock-full of thoughtful examples, practical suggestions, philosophic insights and stunning colour photographs, drawings and charts, and a helpful set of bibliographical footnotes and glossary, Wilson has produced a *tour de force*.

The first two-thirds of the book succinctly surveys a vast scientific literature concerning the nature of past extinctions of life, the creation of new species, the forces of evolution and adaptive radiation, life in the forest canopy and beneath the oceans, and the importance of ecosystems. The writing is vivid and personal, the analysis of scientific controversies such as the meteorite impact theory on dinosaurs is scrupulously fair, aided by lucid footnotes and admission of lack of knowledge. Thus the total known number of species is estimated at 1.4 million; the total number of species on the planet at somewhere between 10 and 100 million.

The last third of this vital book addresses the human impact. It calculates the number of species "doomed each year is 27,000. Each day it is 74, and each hour 3". Species extinctions which took place over a period of one million years now take place in a human lifetime or less. Nor can laboratory synthesis or breeding in botanical gardens, seed banks or zoos rescue more than a handful of species condemned to extinction.

The case for preserving maximum biodiversity is made on firmly utilitarian grounds. "Biodiversity is our most valuable but least appreciated resource." Wild species contribute to hybrid, resistant food crops, to critical pharmaceuticals and to hosts of other benefits to humans. Yet our knowledge of biodiversity barely scratches the surface and each extinct species represents a permanent loss of knowledge and value.

Since half the known species exist in tropical rainforests, 6 per cent of the planet's surface, the critical test is whether our species and this treasure-house of biodiversity can co-exist. Wilson is optimistic, arguing with examples that sustainable biological wealth can outyield commercial logging and slash-and-burn cultivation. The briefly presented examples, from ranching iguanas and Amazon river turtles to strip logging to harvesting wild plants, are intriguing, albeit still in pilot stages. The conclusion is to reject cost-benefit analysis which undervalues benefits from rare and endangered species in favour of "the safe minimum standard" which treats each as "an irreplaceable resource for humanity".

Preserving species includes for Wilson "population management". He advocates each country choosing its own optimal population to be implemented by encouragement or relaxation of birth control and the regulation of immigration, aimed at "a target density and age distribution of the national population". Easier said than done.

Favouring law and international protocols rather than tax incentives and marketable pollution permits, he believes that between now and 2050 intelligent intervention can reduce the loss of species to 10 per cent rather than 25 per cent. He espouses an environmental ethic as well as utilitarian arguments "to let no species knowingly die".

This splendidly produced, thought-provoking book combines a sparkling survey of evolution and extinction in theory and practice with an optimistic, hard-headed approach to the preservation of biodiversity.

*Aaron Segal*

*Aaron Segal is Professor of Political Science at the University of Texas at El Paso.*

ROLF ADLER CREUTZ/TOMORROW

## Call for pragmatic conservation

**The Myth of Wild Africa: Conservation without Illusion**
J S Adams and T O McShane
*W W Norton, New York and London, 1992. $21.95/£15.95*

It is perfectly possible to go down to your local video library and hire a hundred hours' worth of excellent wildlife films from Africa in which no African appears. Though that particular point is not made in this book, this is what the *Myth of Wild Africa* is all about.

Most of the conservation activities in Africa, since they first started early this century, have been initiated by non-Africans for the benefit of non-Africans – initially hunters and colonials, then scientists, and finally tourists. Africa was seen as vast, empty, wild, kaleidoscopic and romantic. Above all, it was there. That was the myth that needed conservation.

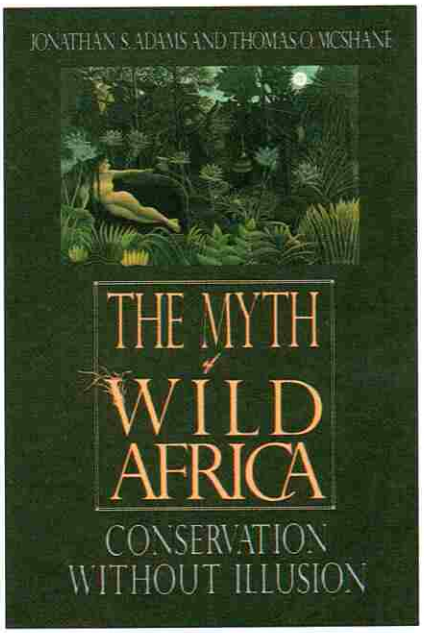
In the course of the narrative, there is some serious and effective debunking of contemporary 'conservation heroes': Bernard Grzimek, Dian Fossey, Richard Leakey, Delia and Mark Owens are all given short (too short) shrift. The multitudes of non-African researchers who have spent thousands of person-years studying African wildlife are chided for having contributed mainly to their own reputations, and not to conservation, wildlife management, and the sustainable use of resources in Africa.

Whatever the merits of the ban on the ivory trade, elephant populations in some countries do need protection, but others need culling. But that it was possible to promote the African elephant as an endangered species, while more than half a million wander the continent, was both amazing, dishonest, and a constraint to rational decision-making.

In one sense Africa's conservation record is very good. Only one single large mammal, the quagga, is definitely known to have gone extinct this century. Africa has more than half of all protected areas in the tropics, almost 450 individual reserves. It is the authors' contention that this has happened largely in confrontation with local people, and that such 'freezing' of large tracts of land is not sustainable.

They argue that long-term conservation in Africa will only be possible when local people have a genuine stake in it. If that means hunting, breeding rhinos for horn and – horror of horrors – even for hunting, a brisk trade in ivory at sustainable levels, hunting for bushmeat, and selective logging, so be it. If large-scale tourism develops, then the benefits must flow down to the local people and not to the capital. If not, poaching and encroachment lead to a gradual confrontation – a confrontation which throughout Africa has already cost hundreds of lives, among wildlife staff and

DARLYNE A. MURAWSKI




poachers alike. And yes, there are limited areas that must remain as strict reserves.

Like all good campaigners, the authors sometimes overstate their case. Many Africans do not and never did live in harmony with their environment, but population sizes were mostly too small to have much impact until this century. There is a very real difference between a bit of selective logging and bushmeat hunting in the vastness of the Gabon rainforest compared to one of the tiny patches of forest that remain in most of West Africa – with their dwindling numbers of forest elephants and chimpanzees.

Many montane forests of the old mountains of eastern Africa are in such a critical position that they desperately need protection – now. Poaching for bushmeat with a blunderbuss which is as likely to kill the poacher, is very different from Richard Leakey's problems in keeping out large bands of motorized poachers coming in from Somalia – they have killed George Adamson, more than a dozen foreign tourists, even more rangers, and uncounted innocent villagers in their quest for ivory.

The authors concede that solutions will vary from place to place. However, the scarlet thread of the book is that conservation must involve using local knowledge and pride, local participation, ensuring clear economic benefits to local communities, and sensitivity to local culture. This calls for a pragmatic and unsentimental approach by conservation authorities.

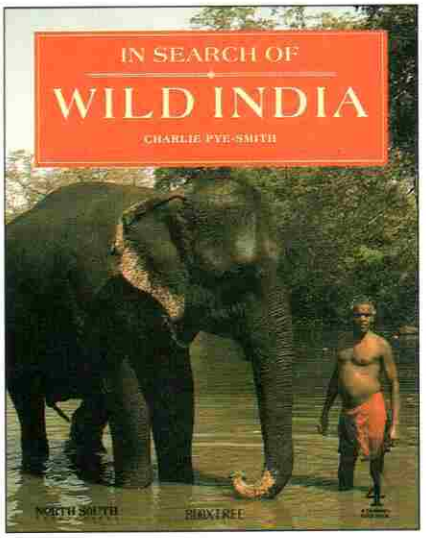
Many 'conservationists' will be up in arms at the authors' main theme and most of the specific suggestions and ideas. Some will be shouting ecological genocide. So who gives us this book? Two staff members of the World Wide Fund for Nature, the people who gave us the PANDA writ large! The book is brave, unsentimental, and thought-provoking. The authors have apparently had some encouragement from the WWF top brass, which is promising. But they are still too polite to mention their organizational flagship, the panda. It has probably been the subject of more conservation attention than any other mammal, but George Schaller's recent book, The Last Panda, shows that even it is still hovering on the brink of extinction.

*Torben Larsen*

*Torben B Larsen is an economist and biologist. He works as a population and family planning consultant and is researching a major book on the butterflies of West Africa.*

## Wild India in retreat

**In Search of Wild India**
Charlie Pye-Smith
*Boxtree, with North South Productions and Channel 4, London,*
*1993, £19.99 (hardback).*




"In India, the relationship between people and nature is of such complexity that it makes no sense to consider one without the other." So writes Charlie Pye-Smith at the end of what was clearly a gruelling, sobering and, at times, exhilarating journey around the mountains, coasts, villages, parks and cities of India.

As he points out, virtually every Indian in the countryside depends to some extent on the products of the forest, whether for fodder and fuelwood or as building material for houses, boats, ox carts, cremations or crafts. But everywhere the forest is being destroyed. The rivers are ebbing. The astonishing variety of wildlife is in retreat.

The pressure of population growth is part of the problem, says Pye-Smith. "From the Cardamon Hills in the deep south to the Himalaya in the north, the uplands bear the scars of overpopulation. Every year the poor, the landless and the plain greedy extend the limits of cultivation, carving fields and terraces from land which previous generations had left as forest, knowing its soils to be too fragile, its slopes too steep."

The pressures on habitats is felt strongly in India's heritage of parks and protected areas, many of which are the scene of open conflict between park officials and local people. These include growing numbers of tribal people. Ten million of India's 65 million tribals have been displaced by development projects – dams, roads and hydro-electric schemes – during the last 40 years. But the number remaining in the countryside has increased, and so has their impact on the forest lands where they mainly live. Conservationists told Charlie Pye-Smith that in many respects they had simply failed to adapt to their changed circumstances.

Elsewhere, the continuing destruction of the coastal mangroves by increasing numbers of local fishermen is threatening both fish stocks and local wildlife. In the Gulf of Kachch, illiterate fishermen with no other access to fuel and fodder, except the mangroves, could turn this marine national park into aqueous desert. Unless, that is, more is done to educate, inform and help the local people to save their own environment. This was recommended by a university team report in 1991 which also drew attention to the need for better education, better health care, improved sanitation and a serious family planning effort.

But the greatest threat to national parks, says Pye-Smith, comes from government ministries and industrial corporations. The action of the Rajasthan state government in handing out mining licences in the Sariska national park is just one example. If mining continues on the present scale, the park with its tigers, leopards and jungle cats, will soon be ruined.

The greatest hope for the parks must lie in the changed attitudes by park authorities, who now accept and promote the principle of 'ecodevelopment'. In theory, at least, this takes the needs of local people into account and makes people part of the solution rather than of the problem. Indeed, as Pye-Smith points out, government cannot save India's wildlife without the help of local communities, pressure groups and non-governmental organizations.

He cites many telling examples of how people themselves are standing up to rapacious developers, as in their fight against the Karnataka Pulpwood Company. The Company bulldozed the forest to grow eucalyptus, destroying not only the forest but the wildlife it contained. The people retaliated by grubbing out the saplings and planting their own trees in a battle which they eventually won.

This book, says Charlie Pye-Smith, is above all "a celebration of all those individuals and organizations who are fighting, often against great odds and with little money, to save the natural world from further destruction". As such, it and the series of films which it accompanies, are a useful – and visually delightful – contribution to that cause.

*John Rowley*